

No. 781,897.

PATENTED FEB. 7, 1905.

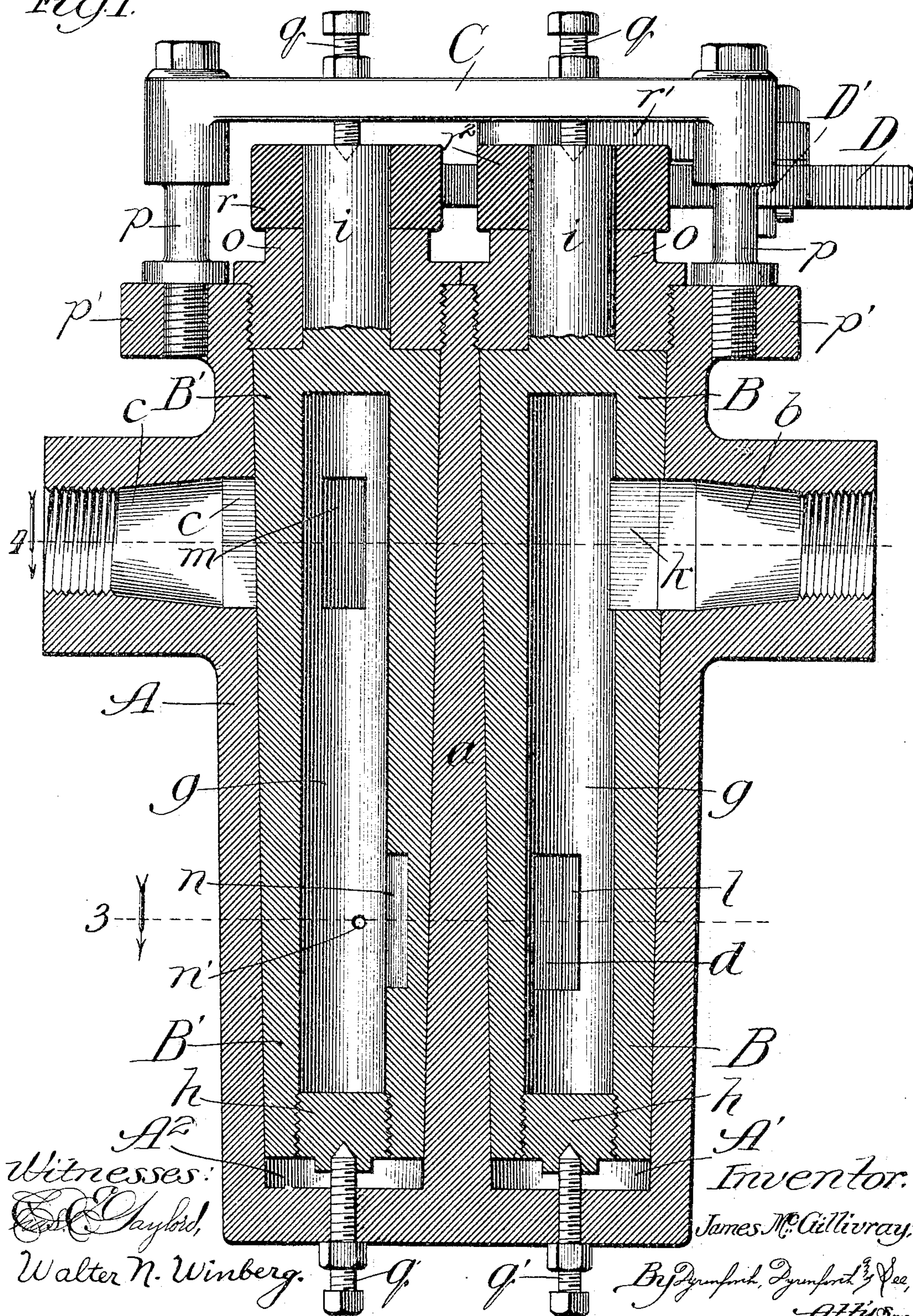
J. MCGILLIVRAY.

VALVE DEVICE.

APPLICATION FILED AUG. 24, 1904.

2 SHEETS—SHEET 1.

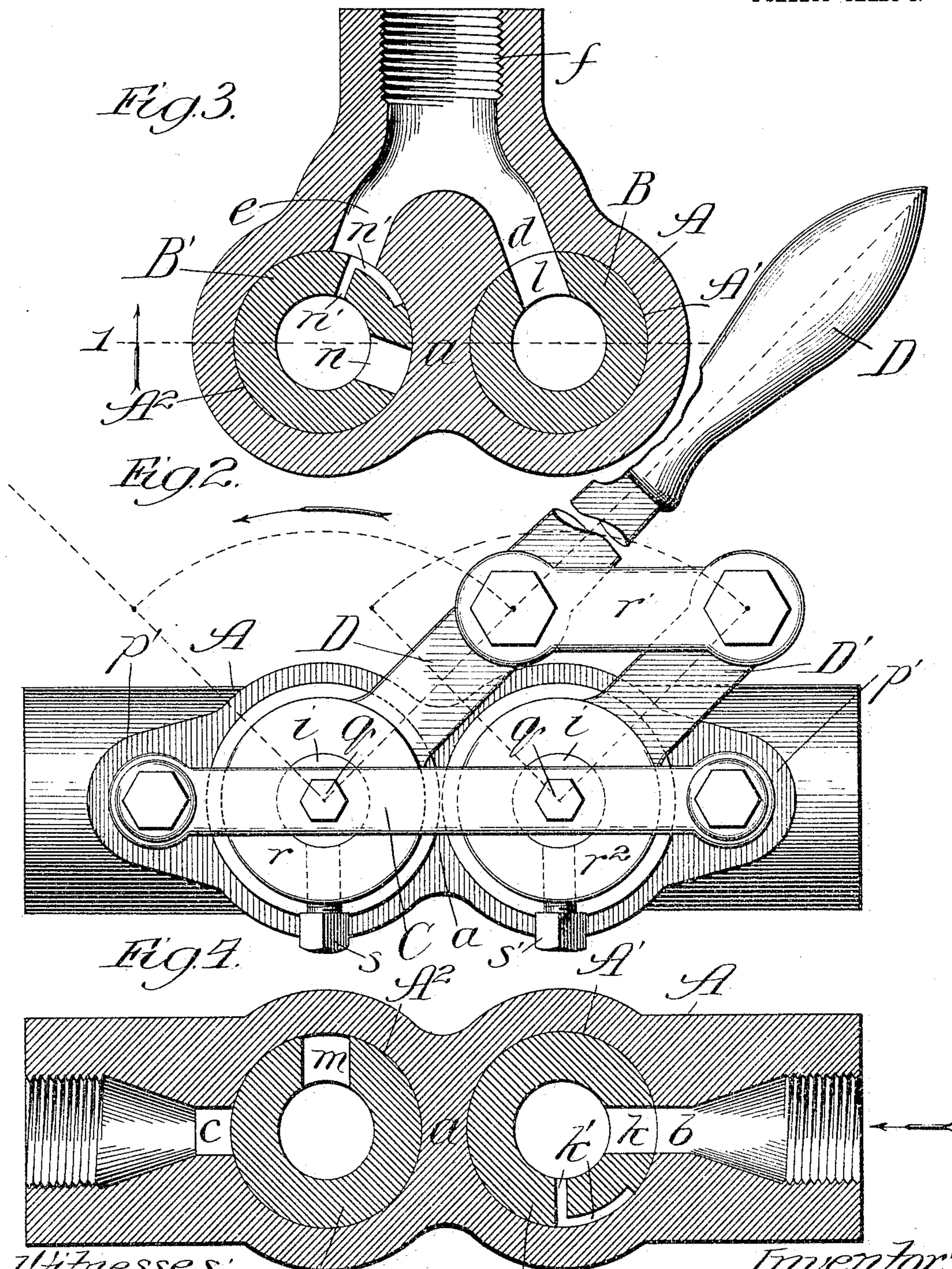
Fig. 1.



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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES MCGILLIVRAY, OF SOUTH CHICAGO, ILLINOIS.

VALVE DEVICE.

SPECIFICATION forming part of Letters Patent No. 781,897, dated February 7, 1905.

Application filed August 24, 1904. Serial No. 221,973.

To all whom it may concern:

Be it known that I, JAMES MCGILLIVRAY, a citizen of the United States, residing at South Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Valve Devices, of which the following is a specification.

My invention relates to an improvement in the class of balanced valve devices for controlling hydraulic and other high pressures; and my object is to provide a novel construction of such a valve device which shall render it simple to manufacture and repair, durable, and of easy and reliable operation.

In the accompanying drawings, Figure 1 shows my improved valve device in vertical sectional elevation, the section being taken at the line 1 on Fig. 3 and viewed in the direction of the arrow; Fig. 2, a broken plan view of the same; Fig. 3, a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow, and Fig. 4 a section taken at the line 4 on Fig. 1 and viewed in the direction of the arrow.

A is the casing, of the preferred shape illustrated, open at its upper end and closed at its lower end, with a central partition *a* dividing the casing into two similar valve-chambers *A*¹ and *A*², which taper toward their inner ends. Near the upper end of the casing are provided, diametrically opposite each other, ports *b* and *c*, shown as internally-threaded nozzles for coupling with them, respectively, a supply and a discharge pipe, (not shown,) one, as the port *b*, being the inlet and the other, *c*, the outlet. Ports *d* and *e* are provided in the casing near its lower end in the plane between the ports *b* and *c*, and they unite in a nozzle *f*, represented with an internal thread for a pipe connection (not shown) leading to the work to be performed by the pressure controlled by the valve device.

B and B' are the hollow rotary valves, each being by preference, like the casing, of brass. I prefer to form each valve out of a solid piece of the brass by boring it out lengthwise from the inner end to the desired length to produce the balancing-pressure chamber *g* within it and tapping that end to receive a screw-plug

h for closing it and to afford a bearing for the adjusting purpose hereinafter described. Each valve is externally tapered longitudinally to fit its respective seat in the casing and terminates at its upper end in a stem *i*. In the valve B is provided an upper port *k* to register with the port *b* and at a right angle thereto a lower port *l*, and this valve is also provided with a supplemental inlet-port or by-pass *k'*. In the valve B' is provided an upper port *m* to register with the port *c* and at a right angle thereto a lower port *n* with a supplemental inlet-port or by-pass *n'*. The valves are set in their respective chambers to cause the ports *k* and *l* to register, respectively, with the ports *b* and *d*, while the ports *m* and *n* are respectively out of registration with the ports *c* and *e*, though in the last-named condition the by-pass *n'* is open to the port *e*, and, as will be understood, when the port *k* is out of registration with the port *b* the by-pass *k'* is open to the last-named port.

Each valve is secured in place in its chamber in the casing by a flanged collar *o*, screwed against its upper end about the valve-stem into the upper end of the chamber, as represented. A bearing-head C is securely supported to extend across the centers of the upper ends of the two valve-stems on posts *p p*, extending from ears *p'*, which project laterally outward from the upper end of the casing. Set-screws *q q*, working in the head C, bear against the upper ends of the valve-stems, and similar set-screws *q' q'*, working through the bottom of the casing, bear against the plugs *h*, closing the valves at their inner ends. Thus the valves are confined endwise between set-screws *q q'*, so that in case of wear tending to impair the fit of a valve in its chamber such wear may be compensated for, owing to the taper form of the valves and their chambers, by partially withdrawing the respective lower set-screw and further driving, correspondingly, the upper companion set-screw to set the valve farther into its chamber.

A collar *r*, surrounding the stem *i* of one valve, to which it is fastened by a set-screw *s*, is on the end of the operating-handle D, and the latter is connected by a link *r'* with

the end of a handle D', which extends from a collar r^2 , surrounding the stem i of the other valve and fastened thereto by a set-screw s' .

To operate the device, the handle D is turned, and with it both valves, to bring the ports k and l into registration, respectively, with the pressure-inlet port b and the pressure-outlet port d and the ports m and n out of registration, respectively, with the pressure-discharge port c and the pressure-return port e . Then the pressure flows through the ports b and k into the chamber of the valve B and out of the latter at the ports l and d to the point where it performs its work. By turning the operating-handle in the contrary direction the valves are turned to close the valve B by bringing its ports k and l out of registration, respectively, with the ports b and d and to open the valve B' by bringing its ports m and n , respectively, into registration with the ports c and e to permit the pressure to discharge from the point of performing its work through the ports c and n and through the chamber of the valve B' and port e .

While the pressure is flowing through the chamber in either valve the latter is necessarily balanced, because the pressure from within it equals that from without, and when either valve is closed the pressure within it is continued, being supplied through its by-pass, which then registers with the supply, so that the valves are also balanced when closed, thereby adapting them always to be turned easily.

My improved construction renders unnecessary any packing in the valve device, thereby avoiding the employment of the parts usually requiring most frequent repairing in valve devices for similar use, and it is comparatively simple and cheap to manufacture.

The advantages of my improvement are attainable without observing, in making it, the exact details of construction shown and described. Hence I do not intend to be understood as limiting my invention to such details.

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

1. In a valve device of the character described, the combination of a casing containing two valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow valve rotatably confined in one of said chambers, having a port to register with said pressure-inlet port and a port to register with said pressure-outlet port, a hollow valve rotatably confined in the other chamber, having a port to register with said pressure-return port and a port to register with said pressure-discharge port, and operating means for said valves connecting them together to be actuated simultaneously, substantially as described.

2. In a valve device of the character described, the combination of a casing containing two valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow valve rotatably confined in one of said chambers, having a port and a by-pass to register with said pressure-inlet port and a port to register with said pressure-outlet port, a hollow valve rotatably confined in the other chamber, having a port and a by-pass to register with said pressure-return port and a port to register with said pressure-discharge port, and means for turning said valves, substantially as described.

3. In a valve device of the character described, the combination of a casing containing two tapering valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow tapering valve rotatably confined in one of said chambers, having a port and a by-pass to register with said pressure-inlet port and a port to register with said pressure-outlet port, a tapering hollow valve rotatably confined in the other chamber, having a port and a by-pass to register with said pressure-return port and a port to register with said pressure-discharge port, and operating means for said valves connecting them together to be actuated simultaneously, substantially as described.

4. In a valve device of the character described, the combination of a casing containing two tapering valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow tapering valve rotatably confined in one of said chambers, having a port to register with said pressure-inlet port and a port to register with said pressure-outlet port, a tapering hollow valve rotatably confined in the other chamber, having a port to register with said pressure-return port and a port to register with said pressure-discharge port, set-screws bearing against the opposite ends of said valves, and means for turning the valves, substantially as described.

5. In a valve device of the character described, the combination of a casing containing two tapering valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow tapering valve rotatably confined in one of said chambers, having a port and a by-pass to register with said pressure-inlet port and a port to register with said pressure-outlet port, a hollow tapering valve rotatably confined in the other chamber, having a port and a by-pass to register with said pressure-return port and a port to register with said pressure-discharge port, and means for turning the valves, substantially as described.

sure-return port and a port to register with said pressure-discharge port, plugs closing the inner ends of said valves and stems projecting from their outer ends, set-screws bearing against said plugs and stems, and operating means engaging said stems and connecting them together for actuating the valves simultaneously, substantially as described.

6. A valve device of the character described comprising, in combination, a casing containing a partition dividing it into two tapering valve-chambers, one of said chambers having a pressure-inlet port and a pressure-outlet port and the other chamber having a pressure-return port and a pressure-discharge port, a hollow tapering valve rotatably confined in one of said chambers, having a port and a by-pass to register with said pressure-inlet port and a port to register with said pressure-outlet port,

a hollow tapering valve rotatably confined in the other chamber, having a port and a by-pass to register with said pressure-return port and a port to register with said pressure-discharge port, stems projecting from the outer ends of the valves, a bearing-head crossing said plugs, set-screws working through said bearing-head against the valve-stems and set-screws working through the base of the casing against the valves, an operating-handle extending from the stem of one valve and a handle extending from the stem of the other valve, and a link connecting said handles, the whole being constructed and arranged to operate substantially as described.

JAMES MCGILLIVRAY.

In presence of—

L. HEISLAR,

WALTER N. WINBERG.