

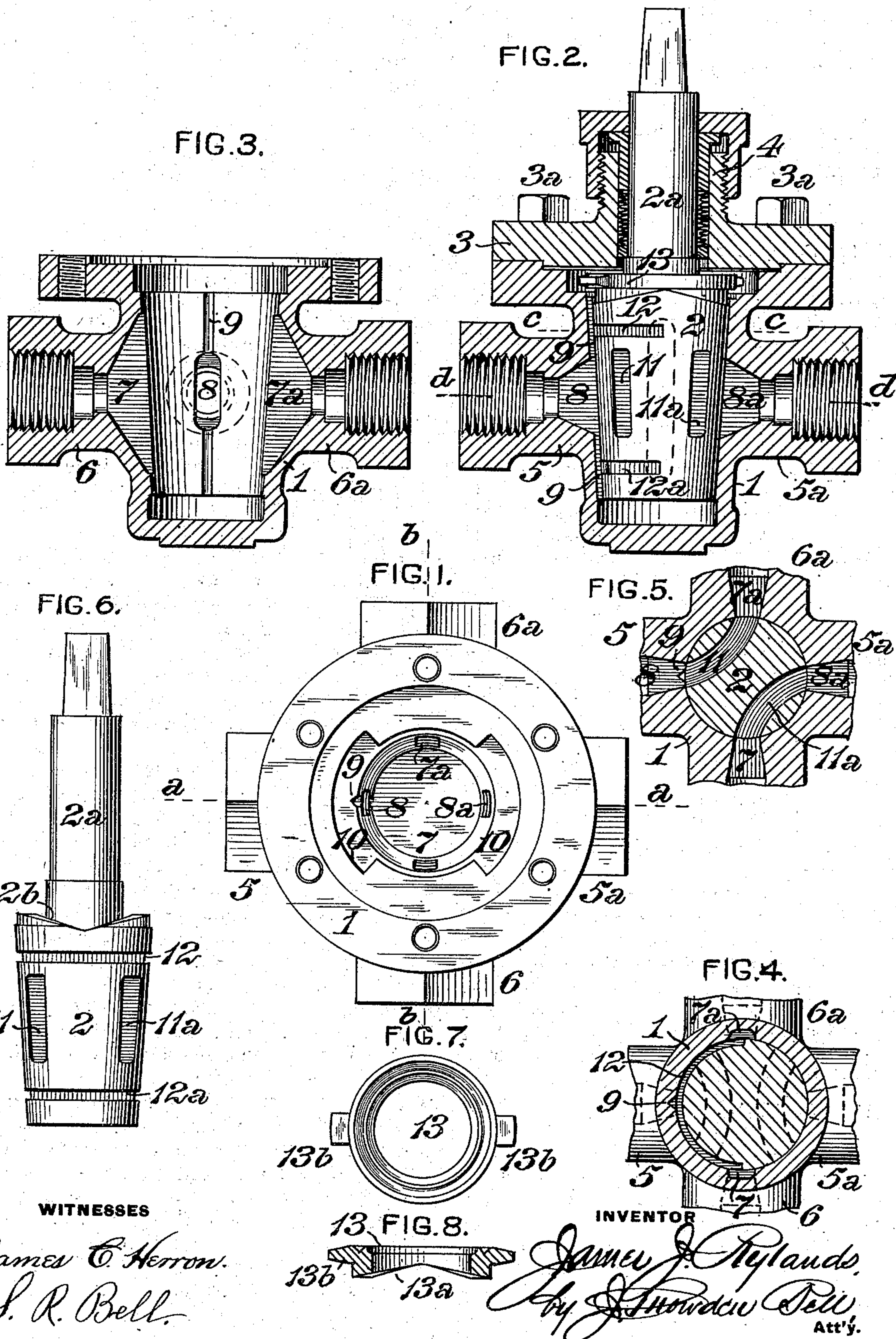
No. 749,750.

PATENTED JAN. 19, 1904.

J. J. RYLANDS.
VALVE.

APPLICATION FILED OCT. 24, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

JAMES J. RYLANDS, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR TO
HOMESTEAD VALVE MANUFACTURING COMPANY, A CORPORATION
OF PENNSYLVANIA.

VALVE.

SPECIFICATION forming part of Letters Patent No. 749,750, dated January 19, 1904.

Application filed October 24, 1903. Serial No. 178,307. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. RYLANDS, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Valves, of which improvement the following is a specification.

My present invention relates to and is an improvement in four-way valves or cocks of the general type which is exemplified in Letters Patent of the United States No. 579,432, granted and issued to the Homestead Manufacturing Company, Limited, (as assignee of W. F. Harrison,) under date of March 23, 1897.

The object of my invention is to provide in a valve of this type simple and inexpensive means whereby fluid under pressure may be simultaneously admitted to and its pressure maintained in two cylinders or other fluid-receptacles and be exhausted independently from either of said cylinders as desired.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a plan or top view of the body of a valve embodying my invention with the cap and valve-plug removed; Fig. 2, a vertical section through the appliance complete on the line *a a* of Fig. 1; Fig. 3, a similar section through the valve-body only on the line *b b* of Fig. 1; Figs. 4 and 5, horizontal sections through the valve body and plug on the lines *c c* and *d d*, respectively, of Fig. 2; Fig. 6, a view in elevation of the valve-plug detached; Fig. 7, a plan view of the restraining-collar, and Fig. 8 a transverse section through the same.

In the practice of my invention I provide a valve body or casing 1, the central chamber of which is properly bored to receive and form the seat of a tapered or frusto-conical valve-plug 2, which is formed integral with or fixed upon a stem 2^a. The open top of the valve-body is closed by a cap 3, which is secured in position by bolts 3^a and is provided with a properly-packed stuffing-box 4, through which the stem of the valve-plug passes. A pair of opposite inlet and discharge nozzles 5 5^a, which are threaded for connection with pipes

leading, respectively, from an accumulator or other source of fluid under pressure and to a suitable point of discharge, is formed upon the valve-body, and a pair of opposite and similarly-threaded cylinder-connection nozzles 6 6^a is also formed upon the body, the common axis of the nozzles 6 6^a being located transversely to and substantially at right angles to that of the inlet and discharge nozzles 5 5^a. The passages 7 7^a, which lead from the central chamber of the valve-body to the bores of the nozzles 6 and 6^a, respectively, are made of substantially greater length than the passages 8 8^a, which connect the central chamber with the bores of the nozzles 5 5^a, the purpose of which increase of length will presently appear. A longitudinal balancing-groove 9 is formed in the central chamber of the body on the inlet side thereof, and segmental recesses 10 are formed in the top of the body for the reception of lugs on a restraining-collar, which is fitted on the stem of the valve-plug.

Two longitudinal through-ports 11 11^a, which are of curved or segmental section in a horizontal plane and are completely separated by an intervening body of metal, are formed in the valve-plug 2, said ports being so located and of such curvature that when the plug is turned into one position they will connect one of the cylinder-connection passages, as 7^a, with the inlet-nozzle 5 and the other cylinder-connection passage, as 7, with the discharge-nozzle 5^a, as shown in Fig. 5. When the plug is turned through a quarter of a revolution, they will connect the cylinder-connection passage 7 with the inlet-nozzle and the cylinder connection 7^a with the discharge-nozzle. When the plug is turned into mid-position—that is, a position intermediate of the two above stated—communication between both of the cylinder-connection passages and the discharge-nozzle will be cut off, as shown in Fig. 4. Direct communication between the inlet and discharge nozzles is not permitted in any position of the valve-plug.

In order to provide a constant supply of fluid under pressure to both the cylinder-connection passages 7 7^a during the periods in

which both are out of communication with the discharge-nozzle, and thereby to hold in position the pistons of the cylinders communicating therewith, which pistons are when moved simultaneously moved in relatively opposite directions, one or more (preferably, as shown, two) peripheral supply grooves or recesses 12 12^a are formed in the valve-plug 2, said grooves extending for such distance (as about one-half) around the valve-plug that when the latter is turned into position to cut off communication between both the cylinder-connection passages 7 7^a and the discharge-nozzle 5^a, as shown in Fig. 4, communication will be established between both the cylinder connections and the inlet-nozzle 5 through the lateral balancing-groove 9 and the supply-grooves 12 12^a, the ends of which latter grooves are when the valve-plug is in this position open to the cylinder-connection passages 7 7^a. Fluid-pressure will thereby be applied to and maintained on the pistons of both the cylinders which communicate with these passages, respectively, and as said pistons are fitted to work one against the other or in relatively opposite directions they and the mechanism to which they are attached will be held stationary during the periods in which the valve-plug remains in the mid-position shown in Fig. 4.

It will be obvious to those skilled in the art to which my improvement relates that a single peripheral supply-groove may, if preferred, be employed instead of the two grooves 12 12^a described and shown. These are, however, believed to be preferable, for the reason that the balancing of the plug when under pressure is promoted by the supply of fluid at two points near its upper and lower ends, respectively, the passages 7 7^a being made of much greater length, as before stated, than the passages 8 8^a to admit of such supply. Such balancing action is exerted in concurrence with that of the admission of fluid above and below the valve-plug through the balancing-groove 9, the provision of which obviates the difficulty and expense of coring a separate inclosed balancing-passage in the wall of the valve-body, as has heretofore been done.

The opening and closing movements of the valve-plug are controlled and its positive seating insured by a restraining-collar 13 in the form of a collar which fits loosely in the upper portion of the plug and is provided with inclined faces or cams 13^a, corresponding with inclined faces 2^b on the plug. The rotary movement of the collar with the plug is limited

by laterally-projecting lugs 13^b, which traverse in the segmental recesses 10 of the valve-body. The construction and manner of operation of the restraining-collar are substantially similar to those of the corresponding device of Patent No. 579,432, before referred to, and it is not therefore claimed as of my present invention.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a valve-body having opposite inlet and discharge passages, and opposite cylinder-connection passages located transversely thereto, and a valve-plug seated in the body and having through-ports independently controlling communication between the cylinder-connection passages and the inlet and discharge passages, respectively, and a peripheral supply-port which communicates with the inlet-passage and with both the cylinder-connection passages when the latter are cut off from the discharge-passage.

2. The combination of a valve-body having opposite inlet and discharge passages, and opposite cylinder-connection passages located transversely thereto, a balancing-groove in the valve-body communicating with the inlet-passage, and a valve-plug seated in the body and having through-ports independently controlling communication between the cylinder-connection passages and the inlet and discharge passages, respectively, and a peripheral supply-port which is constantly open to the balancing-groove and has its terminals in a plane between the inner walls of the through-ports.

3. The combination of a valve-body having opposite inlet and discharge passages and opposite cylinder-connection passages located transversely thereto, a balancing-groove in the valve-body communicating with the inlet-passage, and a valve-plug seated in the body and having through-ports independently controlling communication between the cylinder-connection passages and the inlet and discharge passages, respectively, and two peripheral supply-ports located between the ends of the valve-plug and the adjacent end of the through-ports, said supply-ports being constantly open to the balancing-groove and having their terminals in a plane between the inner walls of the through-ports.

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Witnesses:

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