No. 610,723. Patented Sept. 13, 1898.

H. H. RIGGIN.

STOP VALVE.

(Application filed Feb. 2. 1898.)

(No Model.)

Fig.6

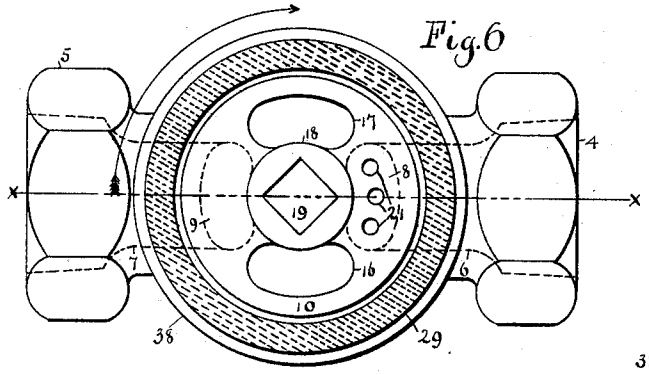


Fig.5

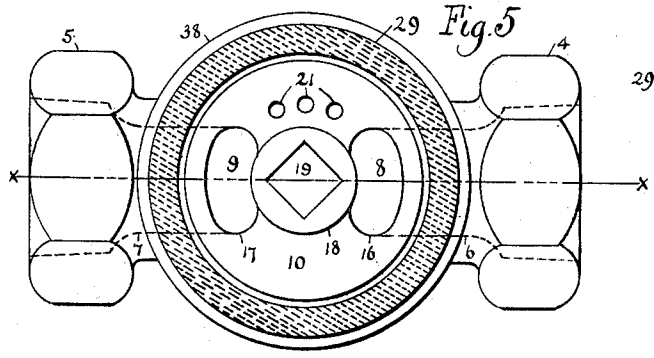


Fig.3

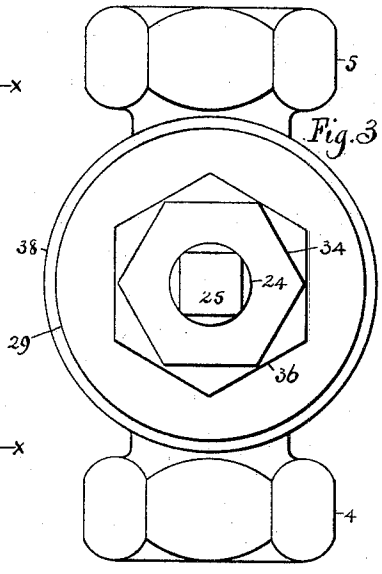


Fig.4

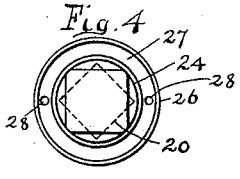


Fig.1

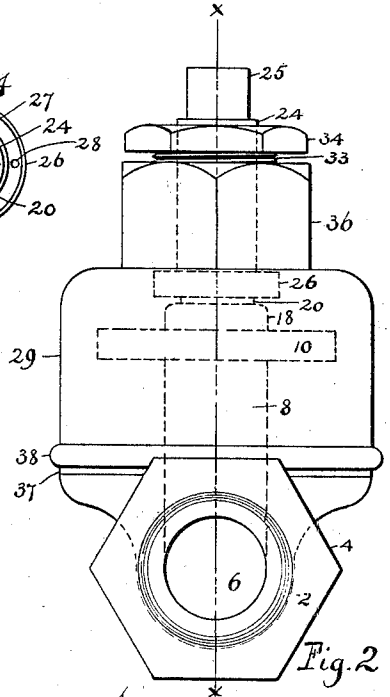


Fig.2

Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY H. RIGGIN, OF ALTOONA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO THE WATSON & McDANIEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

STOP-VALVE.

SPECIFICATION forming part of Letters Patent No. 610,723, dated September 13, 1898.

Application filed February 2, 1898. Serial No. 668,814. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. RIGGIN, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Stop-Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in stop-valves used to control the passing of fluid or liquid which is under high pressure, and the valve must not only remain tight when closed, but must be so constructed as to be opened and closed easily and freely.

The objects of my improvements are to construct a valve of few parts, easily and cheaply manufactured, not liable to become deranged or inoperative, and one wherein all movable or wearing parts may quickly and readily be inspected and without the use or need of specially-constructed tools, but by the use of a simple wrench which is always available wherever such valves are in use.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section on line *x x*, Figs. 2, 5, and 6. Fig. 2 is an end elevation. Fig. 3 is a top view; Fig. 4, a top or plan view of the moving stem. Fig. 5 is a horizontal section on line *y y*, Fig. 1, showing valve in open position, as in Fig. 1. Fig. 6 is also a horizontal section on line *y y*, Fig. 1, showing valve in closed position.

Similar figures of reference refer to similar parts throughout all the views.

The body 1 is circular in section at its upper part, and at its lower part is formed into oppositely-extending necks 2 3, which reach outward and are hexagonally formed at their outer ends 4 5. The necks 2 3 form passages 6 7 upon their inner parts, which are preferably screw-threaded at their outer ends to receive the ends of the connected pipes which carry the fluid or liquid which my valve controls. Instead of having an interior thread I might equally well in some instances use an exterior thread upon the necks and couple the pipes with a union.

From passages 6 7, tending upwardly, are the inlet-passage 8 and the outlet-passage 9, through which the liquid or fluid flows to the valve 10 and the chamber 11 above the valve, the arrows showing the direction of flow. The valve 10 is seated at 12 upon the upper part of body 1, this upper portion being a circular plane pierced by the inlet-passage 8 and the outlet-passage 9, but otherwise a solid surface. The valve 10 has at its lower central part a circular projection 13, inserted in a similar recess 14 in part 15; but the projection does not bottom in the recess. The projection 13 fixes the valve always central, while permitting its quick and easy removal and free rotation.

Ports 16 17 are formed through valve 10 and exactly coincide with passages 8 9. At the upper central part of valve 10 is hub 18, and within its upper part is a square depression 19, somewhat deeper than the square part 20, which fits into it, and the valve 10 is also pierced by three seating-ports 21, located between ports 16 17 and arranged to pass over passage 8 when valve 10 is closed. Valve 10 has a space 22 surrounding its outer periphery 23 and the chambered space 11 above it, so that its only bearing is upon its seat 12.

Centrally above valve 10 is a moving stem or spindle 24, having the square projection 20 at its lower end and another square projection 25 at its upper end. Near its lower end an integral collar 26 is formed, which is above and clear of valve-hub 18. Within the upper part of collar 26 a circular groove 27 is formed, the groove being pierced by two holes 28 bored through from the under side, so that groove 27 communicates with chamber 11.

An outer case 29 surrounds body 1 and is secured thereto by screw-thread 30. The top of case 29 forms chamber 11 and provides the recess 31, wherein collar 26 is placed. Above collar 26 the case 29 is screw-threaded at 32, and a gland 33 is screwed therein, the gland having a hexagonal top 34, and a packing-space 35 being formed below gland 33 and

above collar 26. The upper part of case 29 is made hexagonal at 36, where it surrounds gland 33, and at its lower end a packing-space 37 is formed and a reinforcing-bead 38 is added. A central web 39 supports necks 2 3.

The operation of my mechanism is as follows: The valve-disk 10 being in the position shown in Figs. 1 and 5, the fluid or liquid in passage 6 and inlet 8 will flow upward through port 16 into chamber 11 and through port 17 into outlet-passage 9 and passage 7, as indicated by the arrows. A handle or wrench now being applied to the square 25 of moving stem or spindle 24 and turned in the direction shown by the arrow in Fig. 6, the square projection 20 will cause the valve 10 to rotate ninety degrees and the ports 16 17 to move away from over inlet 8 and outlet 9 and the solid part of valve 10 to cover the inlet and outlet passages 8 9, as seen in Fig. 6. The pressure would now be against valve 10 in passage 8, tending to press it off of its seat 12 and cause it to leak; but to avoid such effect I have made seating-ports 21 through the valve and so placed them that when the valve is closed a sufficient quantity of fluid or liquid will pass through them into chamber 11 and space 22, and thereby hold the valve to its seat. As pressure is above it this also permits the easy movement of the valve, as it is in a measure balanced.

I have also made provision for the free movement of the stem 24 by forming the groove 27 within the top annular space of collar 26 and connecting the groove 27 with the chamber 11 by holes 28, so that pressure is introduced above collar 26, the collar being ground in fluid-tight in recess 31 at its outer periphery. Packing is provided in space 35 to prevent leakage around stem 24. Case 29 screws onto body 1 by thread 30, forming with the packing in space 37 a tight receptacle, and this construction also provides an easy and quick means to get at valve 10 and its seat 12 for their inspection, as by using a wrench on hexagon 36 the case 29 is readily removed, and as square 20 of stem 24 is an easy fit in socket 19 of valve 10 all parts readily come apart and the valve 10 is readily lifted from its seat 12 for the inspection or repair of either.

I claim—

1. A stop-valve having a body part with fluid and liquid inlet and outlet passages formed therein and intercepted by a rotatable disk-valve, a chamber above and around the valve, means of communication from the chamber to the inlet-passage when the valve is closed, means to seat the valve centrally over the passages, means to move the valve rotatably from without the valve-case, and means upon the valve-moving mechanism to introduce pressure from the chamber above the valve to a collar upon the moving mechanism, substantially as set forth.

2. A stop-valve having within its body part inlet and outlet passages terminating in a central flat seat, a disk-valve rotatably mounted upon the seat, a moving stem having a rectangular projection seated in the valve and an enlarged collar above the valve, a case secured to the body part and forming a chamber above and surrounding the valve, a seat within the case for the reception of the collar aforesaid, a groove in the upper annular part of the collar, means of communication from the groove to the chamber, an integral stem above the collar having means to receive an operating-handle, and a gland surrounding the stem, secured to the case, and having means to pack the stem, substantially as described.

3. In a stop-valve, a body part containing inlet and outlet passages, a disk-valve mounted above such passages, and means to control the valve and thereby the flow through the passages, an outer case forming a chamber above and around the valve, means to secure the case to the body part in manner to provide a packing-space between the body and case, means of communication from the inlet-passage within the body part to the chamber above and around the valve when the outlet-passage is closed, a collar forming an annular space on the valve-moving mechanism, a seat formed above the chamber to receive the collar, and means of communication from the chamber to the annular space aforesaid for the passage of pressure liquid or fluid such as passes through the valve, in manner and form substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY H. RIGGIN.

Witnesses:
G. H. ROGERS,
L. S. WRIGHT.