No. 680,737. Patented Aug. 20, 1901.

L. SCHUTTE.

VALVE.

(Application filed June 8, 1900.)

(No Model.)

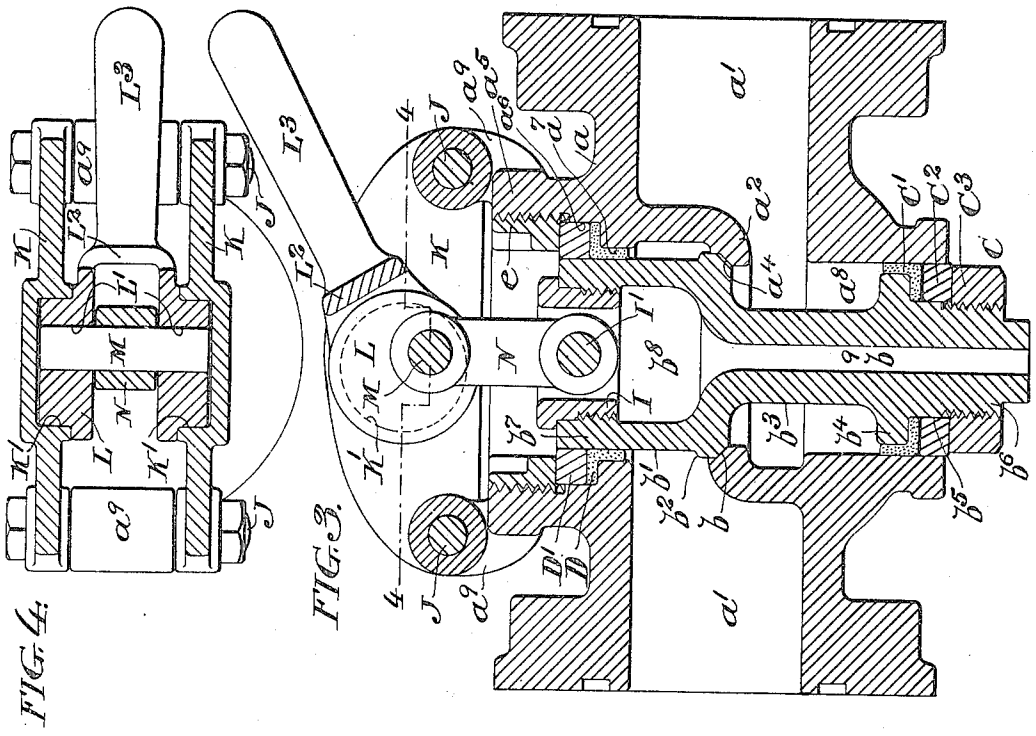


FIG. 4.

FIG. 3.

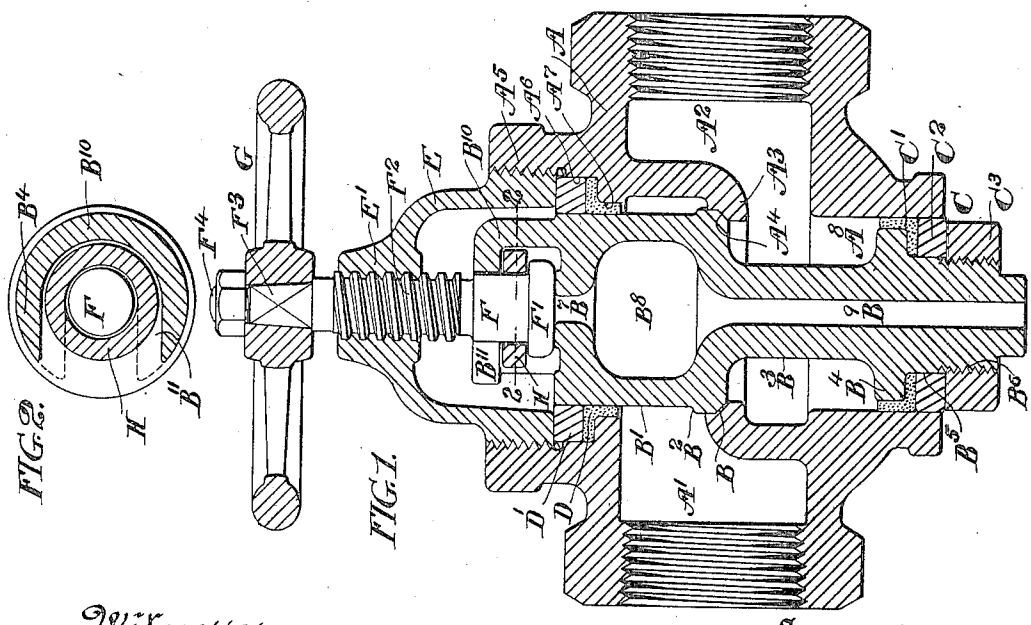


FIG. 2.

FIG. 1.

Witnesses.
Harry Drury
H. Havard

Inventor.
Louis Schutte
by his atty
Francis J. Chambers

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

UNITED STATES PATENT OFFICE.

LOUIS SCHUTTE, OF PHILADELPHIA, PENNSYLVANIA.

VALVE.

SPECIFICATION forming part of Letters Patent No. 680,737, dated August 20, 1901.

Application filed June 8, 1900. Serial No. 19,520. (No model.)

To all whom it may concern:

Be it known that I, LOUIS SCHUTTE, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Valves, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction of valves, and has for its object to provide a valve of simple construction and one especially adapted for use in connection with high pressures, my improvement consisting in a special construction whereby the valve is perfectly balanced when open and whereby when closed pressure from either direction tends to seat the valve; also, in other details of construction, all of which will be best understood as described in connection with the drawings, in which they are illustrated, and in which—

Figure 1 is a central sectional elevation of a valve embodying my invention; Fig. 2, a cross-section on the line 2 2 of Fig. 1; Fig. 3, a central sectional elevation of a valve embodying my invention with certain modification, and Fig. 4 a cross-section on the irregular line 4 4 of Fig. 3.

Describing first the construction shown in Fig. 1, A indicates the valve-casing, divided into two chambers A′ and A^2 by a partition, in which is formed the valve-seated port, (indicated at A^4.) A^5 is an annular internally-threaded projection from the top of the valve-casing continued, as shown, in the lower part of which is formed the internally cylindrical surface A^6, which communicates with the chamber A′ through a cylindrical portion A^7 of less diameter. A^8 indicates a cylindrical opening formed in the bottom of the casing leading from the chamber A^2. The diameter of the cylindrical portion A^7 should be at least equal to and preferably somewhat in excess of the greater diameter of the valve-seat A^4, and the diameter of the cylindrical opening A^8 should be greater than the smaller diameter of the valve-seat and less than its larger diameter. B indicates the valve, fitting on the conical seat A^4 and having connected with its upper face the piston-like extension B′, which for the best results should be equal in diameter to the cylinder A^8 and of course somewhat less in diameter than the greater diameter of the valve B, B^2 indicating the annular surface equal in breadth to the difference between the greater diameter of the valve-seat and valve and the diameter of the piston B′. B^3 indicates an extension from the lower face of the valve, having formed on it the piston-head B^4, below which there are also formed on it the cylindrical portion B^5 and threaded portion B^6. B^7 B^8 B^9 indicate an opening leading from the top of the piston B′ through the valve, the stem B^3, and piston-head B^4. B^{10} indicates a slotted arm extending from the top of the piston B′, B^{11} indicating the slot. At C, I have indicated the piston attached to the piston-head B^8, consisting in the first place of the piston-packing C′, fitting in the cylinder A^8, the packing-ring C^2, and the nut C^3. D indicates cylinder-packing secured in the cylindrical opening A^7 by the action of the packing-ring D′, clamped in place by the cap E screwing into the annular extension A^5 and having formed in its upper portion the threaded perforation E′. F indicates a piston-actuating rod which is adapted to enter the slot B^{11}, as shown, and has an enlarged end F′, which rests on or near the top of the piston B′, H being a ring situated on the rod F and placed between the head F′ and the sides of the bracket B^{10}. The valve-rod is threaded, as indicated at F^2, where it passes through the threaded perforation E′ and squared near its top to receive the hand-wheel G, which is held in place by a nut screwing on a threaded terminal F^4.

The modified construction shown in Figs. 3 and 4 does not differ in material respects from that shown in Figs. 1 and 2. I have indicated the similar though somewhat different parts by small letters having the same exponents as the capital letters in Figs. 1 and 2, and will only call attention to the features in which the modification presents salient differences from the construction already described. As shown in Fig. 3, the piston extension *b′* is open at top and has screwing into it a perforated plug I, through which extends transversely a pivot-pin I′. In place of holding the ring D′ and packing D in place by the cap E the modification shows it held

in place by an externally-threaded annular ring, (indicated at *e*.) The casting in the modification has perforated lugs a^9 a^9, which extend up from opposite sides of the annular extension a^5, and to these lugs are secured, as shown, cross-bars K K, having cylindrical bearings formed in them, as indicated at K′ K′. These bearings support the circular blocks L L, connected together at one side, as by a cross-bar L^2, from which extends a lever-arm L^3. L′ L′ indicate eccentrically-placed opposite holes in the blocks L L, supporting the pin, (indicated at M,) between which and the pin I′ extends the link N. It will readily be seen that by turning the handle L^3 the valve is raised or lowered, just as in the case of Fig. 1 it is raised or lowered by turning the hand-wheel G.

It will readily be seen that as the pistons B′ and C are of equal diameter the valve when opened is exposed to equal and opposite pressure in both directions and is perfectly balanced. When the valve is closed, an excessive pressure coming into the chamber A′ acts to hold the valve to its seat by a pressure applied on the annular shoulder B^2. On the other hand pressure on the chamber A^2 also tends to hold the valve to its seat, because it acts in a direction to seat the valve on the piston C, which is larger than the smaller diameter of the valve B, upon which the pressure acts in the other direction.

The construction described has also the advantage of permitting the ready insertion of the valve through the annular extension A^5. The parts making up the piston proper (indicated at C) being removed, piston C and the parts making up the cylinder-packing at the top of the valve being also removed, the valve can be inserted in place and the packing devices afterward inserted and secured as shown.

The function of the opening B^7 B^8 B^9 is to permit any water leaking through the packing D to escape through the valve and its extension, where it is less troublesome and more easily observed than if it accumulated on top of the valve-chamber.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a valve, a casing having chambers, as A′ A^2, connected by a valve-seated port, as A^4, a cylinder, as A^8, situated below the valve-seat of greater area than its narrower portion and a cylinder situated above said seat of less area than its broader portion, in combination with a valve, as B, adapted to seat itself on the valve-seat, a piston, as C, attached to the valve and moving in the lower cylinder, a piston, as B′, also attached to the valve and moving in the upper cylinder and means for actuating said valve.

2. In a valve, a casing having chambers, as A′ A^2, connected by a valve-seated port, as A^4, a cylinder, as A^8, situated below the valve-seat of greater area than its narrower portion and a cylinder situated above said seat of less area than its broader portion, in combination with a valve, as B, adapted to seat itself on the valve-seat, a piston, as C, attached to the valve and moving in the lower cylinder, a piston, as B′, also attached to the valve and moving in the upper cylinder, an opening, as B^7 B^8 B^9, through the pistons and valve, and means for actuating said valve.

3. In a valve, a casing having cylinders, as A^8 and D D′, of equal diameters and arranged in line with each other and a valve-seated port, as A^4 situated between said cylinders, the valve-seat being in its smaller diameter narrower than the lower cylinder and in its larger diameter larger than the upper cylinder, in combination with a valve, as B, adapted to seat itself on the seat of port, A^4, and having attached to it pistons C and B′ of equal diameter moving in the cylinders aforesaid.

4. A valve-casing, as A, having two chambers connected by a valve-seated port, as A^4, an opening, as A^7, above and in line with the port of a diameter not less than the greater diameter of the valve-seat, and a cylindrical opening, as A^8, below the seat of a diameter less than the greater and more than the lesser diameters of said seat, in combination with a valve, as B, adapted to seat itself on the seat in the casing and to pass through opening A^7, a piston-head, as B^4, secured to the lower face of the valve and of less than the narrowest diameter of the seat, a piston, as B′, secured to the upper face of the valve and of less diameter than opening A^7, cylinder-packing, as D D′, and means for securing it in opening A^7 and around piston B′ after said piston is in place and piston-packing, as C′ C^2, and means for securing it to piston-head B^4 and in cylinder A^8 after said cylinder-head is in place.

5. A valve-casing, as A, having two chambers connected by a valve-seated port, as A^4, an opening, as A^7, above and in line with the port of a diameter not less than the greater diameter of the valve-seat, and a cylindrical opening, as A^8, below the seat of a diameter less than the greater and more than the lesser diameters of said seat, in combination with a valve, as B, adapted to seat itself on the seat in the casing and to pass through opening A^7, a piston-head, as B^4, secured to the lower face of the valve and of less than the narrowest diameter of the seat, a piston, as B′, secured to the upper face of the valve and of a diameter equal to that of cylindrical opening A^8, cylinder-packing, as D D′, and means for securing it in opening A^7 and around piston B′ after said piston is in place and piston-packing, as C′ C^2, and means for securing it to piston-head B^4 and in cylinder A^8 after said cylinder-head is in place.

LOUIS SCHUTTE.

Witnesses:
CHAS. F. MYERS,
D. STEWART.