No. 640,615. Patented Jan. 2, 1900.

A. BORDEN.

VALVE.

(Application filed Aug. 17, 1898.)

(No Model.)

FIG. 3.

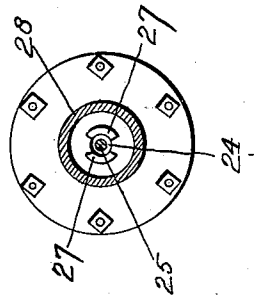


FIG. 4.

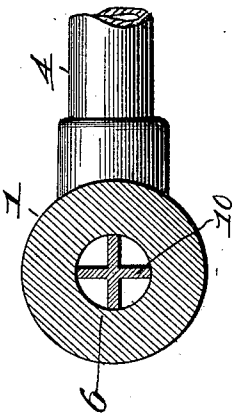


FIG. 2.

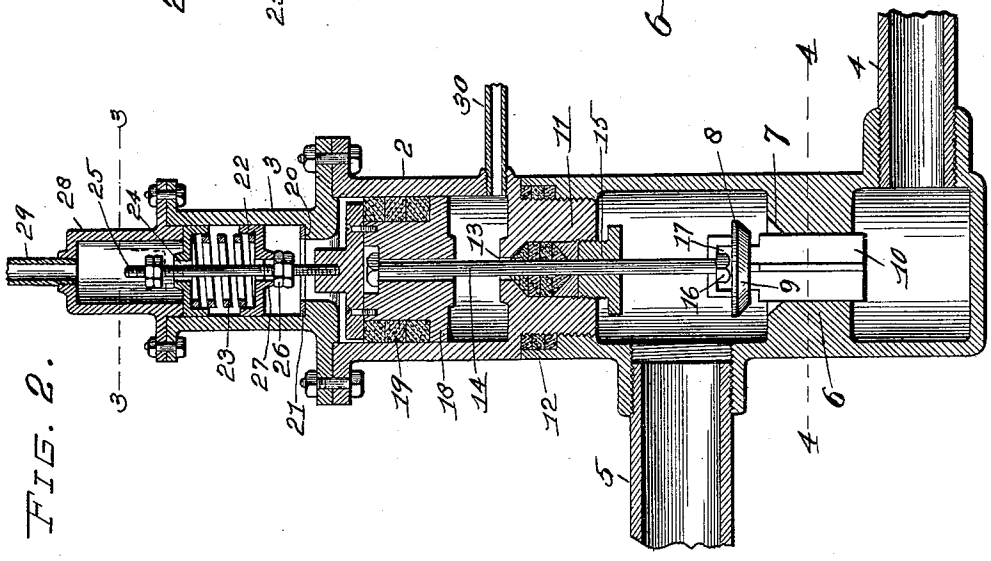
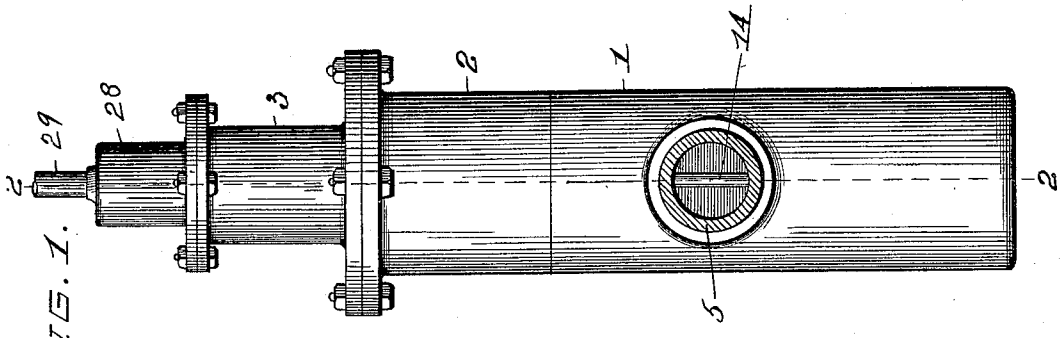


FIG. 1.



Attest
M. P. Smith
Maude Griffin.

Inventor:—
Albert Borden:—
By Higdon & Longan
Atty's.

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

UNITED STATES PATENT OFFICE.

ALBERT BORDEN, OF ST. LOUIS, MISSOURI.

VALVE.

SPECIFICATION forming part of Letters Patent No. 640,615, dated January 2, 1900.

Application filed August 17, 1898. Serial No. 688,835. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BORDEN, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to valves; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is an elevation of a valve of my improved construction. Fig. 2 is a vertical sectional view taken approximately on the line 2 2 of Fig. 1. Fig. 3 is a transverse sectional view taken approximately on the line 3 3 of Fig. 2. Fig. 4 is a transverse sectional view taken approximately on the line 4 4 of Fig. 2.

In the construction of my improved valve I make use of a valve-casing 1, a piston-cylinder 2, and a spring-casing 3, said spring-casing 3 surmounting the piston-cylinder 2, which piston-cylinder is carried by the upper end of the valve-casing 1.

The valve-casing 1 is in the form of a hollow cylinder having an open top and closed bottom, and tapped into one side of the lower end of said cylinder is a tubular connection 4, and tapped into said cylinder 1, adjacent the upper end thereof and on the opposite side from said tubular connection 4, is a tubular connection 5. Formed integral with the interior of the cylinder 1, between the connections 4 and 5, is an inwardly-projecting flange 6, in the top of which is formed a beveled valve-seat 7. Adapted to engage upon this valve-seat 7 is a disk valve 8, the same being provided with a beveled lower edge 9, and formed integral with said valve and projecting downwardly through the valve-opening in the flange 6 are the rectangularly-arranged wings 10.

The upper end of the cylinder, comprising the valve-casing 1, is interiorly screw-threaded and adapted to receive the exteriorly-screw-threaded lower end 11 of the piston-cylinder 2, there being suitable packing 12 arranged between said lower end 11 and the upper end of the casing 1. Passing vertically through the lower end of the piston-cylinder 2 is a vertical bore or passage 13, through which operates a connecting-rod 14, there being a suitable stuffing-box 15 located in the lower end 11, said stuffing-box 15 being for the purpose of packing this connecting-rod 14. The lower end of the connecting-rod 14 is provided with a head 16, that engages in a recess 17, formed in the top of the valve 8, while the upper end of said connecting-rod 14 is seated in a piston 18, the periphery of which piston is suitably packed, as indicated by 19, and said piston being arranged for vertical movement in the piston-cylinder 2.

Formed on or fixed to the upper end of the piston-cylinder 2 is the spring-casing 3, the same being somewhat smaller in diameter than is the casing 1 and cylinder 2, and said casing 3 is provided at its lower end with the inwardly-projecting shoulder 20, on the top of which is located a packing-ring 21. Oppositely-arranged spring-cups 22 are arranged for vertical movement in the spring-casing 3, between which cups 22 is located an expansive coil-spring 23, and formed in the centers of each of the spring-cups 22 are the apertures 24, through which apertures passes the rod 25, the lower end of which is screw-seated in the top of the piston 18. This rod 25 is screw-threaded, and adjusting-nuts 26 are located upon said rod above and below the spring-cups 22, said nuts engaging against lugs 27, formed integral with the faces of said spring-cups, adjacent the apertures 24 therein.

Formed on or fixed to the upper end of the spring-casing 3 is a cap 28, into the upper end of which leads a tubular connection 29, there being a like tubular connection 30 tapped into the lower end of the piston-cylinder 2.

The operation of my improved valve is as follows: Assuming that the valve is open, as illustrated in Fig. 2, it is clearly seen that any fluid will readily pass in either direction through the tubular connections 4 and 5, through the valve-opening, from the seat at the top of which the valve 8 is elevated. When it is desired to close the valve to cut off the passage through the valve-casing 1, the compressed air, water, or other fluid under pressure that is utilized to operate the valve is allowed to enter through the connection 29, from whence it will pass into the cap

28, from thence downwardly through the apertures 24 in the spring-cups, through the lower portion of the spring-casing 3, and onto the top of the piston 18. The pressure of the air, water, or other fluid will cause the piston 18 to move to the lower end of the piston-cylinder 2, and as this movement takes place the connecting-rod 14 is lowered, and by so doing the valve 8 is forced onto the valve-seat 7, thereby tightly closing the passage through the valve-casing 1. During this operation of closing the valve it is essential that the tubular connection 30 be given vent, in order that any air or liquid that has been within the lower portion of the piston-cylinder 2, beneath the piston, will readily discharge. To open the valve after it has once been closed, air, water, or other fluid under pressure enters through the tubular connection 30, beneath the piston 18, which action will necessarily elevate said piston and contiguous parts, which opens the valve, and during this last-mentioned operation the tubular connection 29 must act as a vent or discharge pipe for the fluid that has been above the piston.

By providing the spring 23 and the rod 25 with the adjusting-nuts thereon the valve is prevented from operating too quickly in both directions, which quick action might result in breakage or excessive wear of the parts of the valve. Where the fluid under pressure is turned on quickly to open or close the valve and the piston 18 is suddenly raised or lowered, the adjusting-nuts 26 upon the rod 25 will strike against the lugs 27 on the spring-cups 22, and the spring will be slightly compressed, thus breaking the sudden impact resulting from the quick movement of the piston 18.

A valve of my improved construction may be used for a great number of purposes and possesses superior advantages in point of simplicity, durability, and general efficiency.

I claim—

1. In a valve, the cylindrical valve-casing 1, the disk valve 9 closing the passage through said casing, the piston-cylinder 2 surmounting said casing, the piston 18 operating within said cylinder, the rod 14 connecting the piston with the disk valve, means whereby fluid under pressure is introduced above and below the piston, and means connected to the piston whereby the impact of the disk valve resulting from the sudden movement of the piston is broken in both directions, substantially as specified.

2. In a valve of the class described, a valve-casing 1, the disk valve 8 closing the passage through said casing, the piston-cylinder surmounting the valve-casing, the piston 18 operating within said cylinder, a rigid connecting-rod 14 between the piston and the disk valve, a spring-casing 3 surmounting the piston-cylinder, the spring-cups 22 arranged for vertical movement within the spring-casing, lugs 27 integral with the exterior faces of said spring-cups, an expansive coil-spring located between said spring-cups, the connecting-rod 25 from the piston, the same passing through said spring-cups, the adjusting-nuts 27 located upon said rod outside of said cups, the cap 28 surmounting the spring-casing, and means whereby fluid under pressure is introduced above and below the piston, substantially as specified.

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

ALBERT BORDEN.

Witnesses:
M. P. SMITH,
JOHN C. HIGDON.