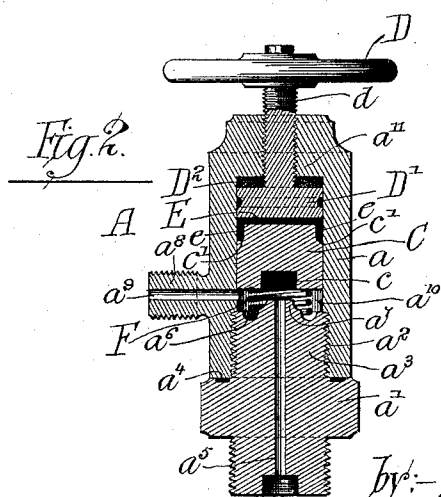
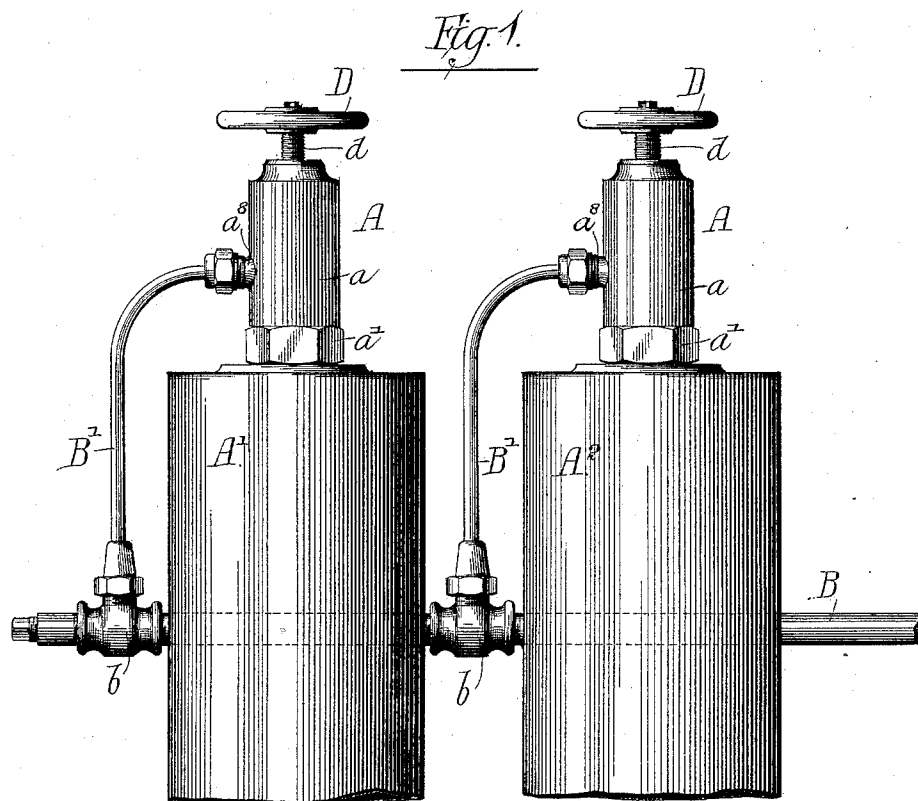


(No Model.)

C. F. A. CONVERT.
VALVE.

No. 465,835.

Patented Dec. 29, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

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VALVE.

SPECIFICATION forming part of Letters Patent No. 465,835, dated December 29, 1891.

Application filed March 10, 1891. Serial No. 384,401. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERICK ADOLF CONVERT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Pressure-Tanks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved construction of valves applied to tanks containing gas under a high pressure, and has for its object the production of a valve of simple, cheap, and durable construction, which may be so packed as to effectually prevent the escape of gas when closed, but which may be freely opened by the exercise of the minimum amount of pressure on the valve-stem.

To this end the invention consists in the construction illustrated in the accompanying drawings, and pointed out more particularly in the appended claims.

Figure 1 illustrates in side view the top portion of two cylinders or tanks connected together and provided with my invention. Fig. 2 is a central vertical sectional view of the valve.

In said drawings, let A represent the valve as a whole, A' one tank, and A² the other.

The valve A consists of a housing of two sections *a* and *a'*, joined together by a left-handed screw-threaded connection *a*². The upper section *a* is cylindrical and its open lower end is screw-threaded interiorly at *a*² to receive the left-hand screw-threaded hub or plug *a*³ of the lower section *a'*. This plug *a*³, being of lesser diameter than the section *a'*, forms a shoulder for the reception of the annular rubber packing-ring *a*⁴ between the said shoulder and the extreme end of the section *a*, as shown in said Fig. 2. The lower portion of the part *a'* is provided with a downwardly-projecting hub screw-threaded on its periphery, whereby the entire valve A is secured to the upper end of the cylinder. The part *a'* is also provided with a central passage-way or opening *a*⁵, through which gas may pass from the interior of the cylinder A' to the interior of the valve, as hereinafter explained.

The upper end of the part *a'* of the valve is provided with an annular groove or slight depression *a*⁶, which surrounds the central raised portion *a*⁷ thereof, thus constituting said central portion or hub a valve-seat.

The hollow upper portion *a* of the valve is provided at one side with a projecting hub *a*⁸, screw-threaded upon its periphery. A passage-way *a*⁹ through said hub *a*⁸ communicates with the interior chamber *a*¹⁰ of the upper section *a*.

B is a pipe provided at suitable intervals with T-couplings *b*, from which latter extend the pipes B'. The latter are connected by the usual coupling device with the hubs *a*⁸. The pipes B B' are used both to convey the supply of gas to the tanks when the latter are to be filled, and also to convey the gas from the tanks to the place where the gas is to be distributed and used.

In the upper portion *a* of the valve is a piston or valve C, provided centrally upon its under surface with a hard-rubber seat *c*, and having an annular recess or groove at its upper end, forming a shoulder *c'*.

D is a handle secured to the outer end of the screw-threaded stem *d*, which latter is secured to a plunger D'. The plunger D' is in the upper part of the chamber *a*¹⁰, above the valve C, as shown. The threads on the stem *d* are right-handed threads. Between the upper portion of the plunger D' and the under or lower portion of the end or top *a*¹¹ of the valve I place a suitable rubber or leather gasket or packing-ring D². Beneath the plunger D' and between it and the piston C is a cup-shaped packing E, provided with a downwardly-projecting annular flange *e*, which latter fits nicely in the recess *c'* in the piston.

Surrounding the hub or valve-seat *a*⁷, and located between the piston or valve C and the end of the plug *a*³ is a spiral spring F, the upper end of which presses against and beneath the piston or valve C, and the lower end of which rests in the groove *a*⁶. The pressure of this spring need be only sufficient to raise the piston or valve C when there is no pressure of gas from the interior of the tank and to hold the piston above the valve-seat *a*⁷. When the tank A', for example, is empty, the parts will then be in the position

shown in Fig. 2, the piston or valve C being held upwardly away from the seat a' by the spring F. One end of the pipe B may then be connected with a suitable source of gas-
 5 supply and the tank A' be filled, the gas flowing through the pipes B B' into the passage-way a^9 to the interior a^{10} of the valve A, and thence downwardly through the central opening a^5 in the part a' into the tank. The gas-
 10 ket or packing a^4 prevents any leakage at the union of the two sections $a a'$. When the tank is filled, the valve C is moved down onto the seat a' against the spring F by the handle D, stem d , and plunger D', and closing
 15 the opening of the passage-way a^5 cuts off the escape of gas from the tank A'. The packings E and D² prevent escape of gas through the upper part a of the valve when the one valve A is connected to the pipes B and B'
 20 while other tanks are being filled, it being understood that the instant the valve or piston C is moved downwardly to prevent the further inflow of gas to the tank A' the pressure of the gas will be exerted against the
 25 side or periphery of the valve C and will seek to escape into the upper part of the chamber a^{10} above the said valve C, and thence outwardly to the atmosphere, and for this reason I provide the two packings D² E.
 30 When the tank A' is filled, the pipe B' is usually disconnected from the hub a^8 and the tank and valve A shipped to the user, who simply makes any desired coupling or connection to the said hub and opens the valve by
 35 turning the handle D. Heretofore the stems of the valves have been packed so tightly with rings, stuffing-boxes, and the like as to make it very hard to turn the handle to open the valve, and in many cases the aid of a wrench
 40 is required to open the valve. The valve hereinbefore described is so simply packed as to produce the minimum amount of friction and may therefore be easily opened by the application of a slight amount of power exerted by
 45 one hand on the handle D, while at the same time the valve is effectively and securely packed against leakage. In use, however, it is customary to set up a plurality of tanks containing gas under high pressure and connect
 50 the said tanks by a common pipe to the source of delivery—as, for example, a soda-water fountain. Such an arrangement is illus-

trated by Fig. 1 of the drawings, wherein I show two of said tanks. Assume the pipe B to be now connected with a distributing apparatus 55 and the gas in the tank A² is to be used first. The valve A on said tank A² is opened, whereupon the gas in the tank A² will flow upwardly through the passage a^5 into chamber a^{10} , through passage a^9 , pipe B' to coupling b and 60 pipe B. It will also flow into the other pipe B' and into the passage a^9 of the valve on the tank A'. It is therefore important to have this valve well packed, and this, I claim, is properly effected by the particular construction 65 employed, consisting of the downwardly-projecting cup-shaped rubber packing E between the plunger D' and the valve C, and also by the gasket or packing-ring D². When the plunger D is pressed firmly against the 70 valve C, the packing E is spread tightly against the interior wall of the upper part a of the valve. In opening the valve the power exerted by the hand of the operator on the handle D is supplemented by the action of the 75 spring F and the pressure of the gas on the under side of the valve or piston C.

The object in making the threads on the stem d right handed and those on the plug a^8 left handed is to prevent in the event of any 80 accidental tightening or sticking of the stem d the unscrewing or loosening of the two parts of the valve A (and thereby permit the escape of gas from the tank to which the valve is applied) when the valve C is being opened, 85 and which would obviously occur if both threads were cut the same.

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

A valve for pressure-tanks, comprising a 90 two-part shell having inlet and outlet passages, a separate valve in said shell, a spring for holding said valve normally from its valve-seat, a stem and plunger for actuating said valve against said spring, and a cup-shaped 95 packing in said shell between said valve and said plunger, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

C. F. ADOLF CONVERT.

Witnesses:

TAYLOR E. BROWN,
 GEORGE W. HIGGINS, Jr.