

H. I. LEA.  
FLUID SEALED VALVE.  
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934,447.

Patented Sept. 21, 1909.

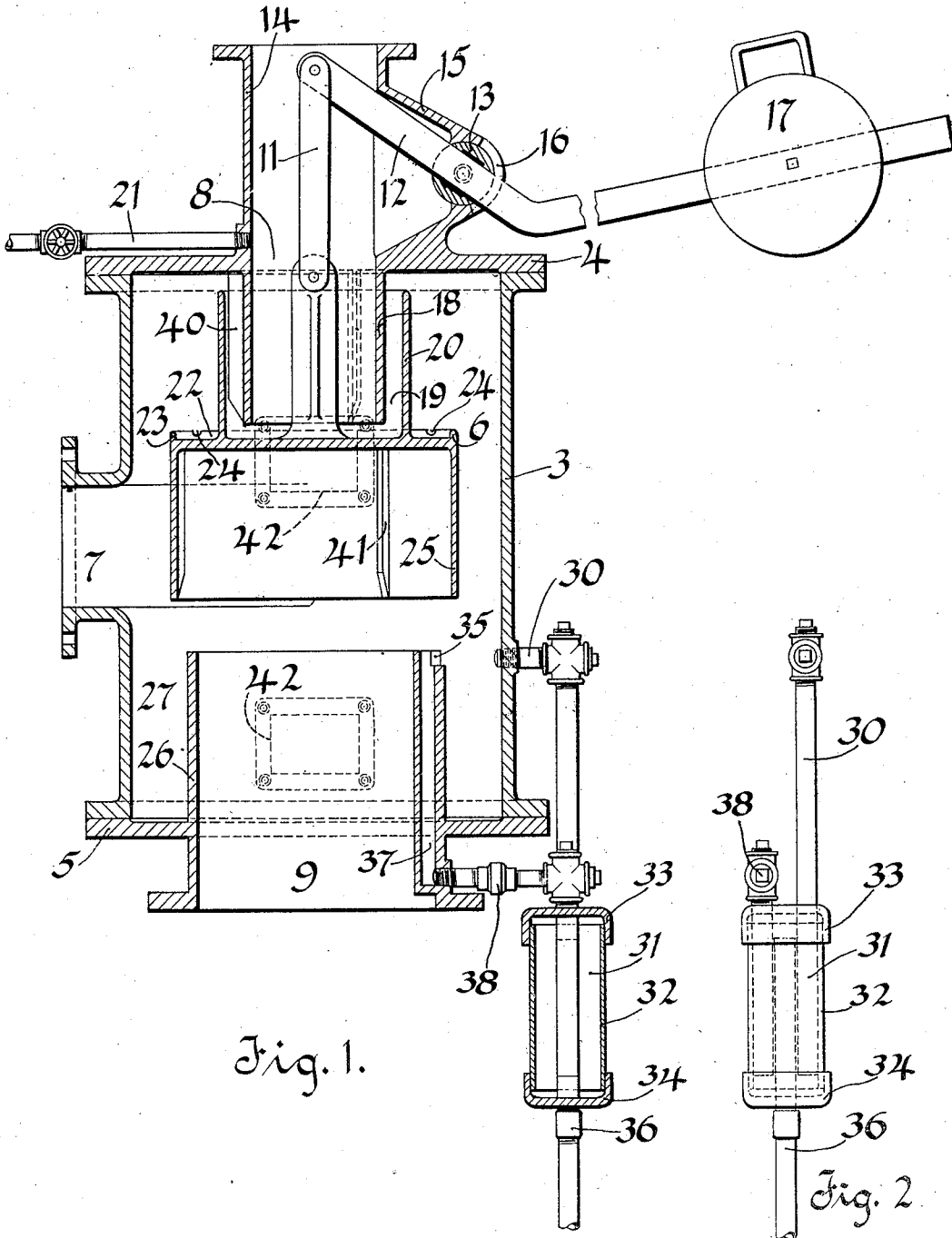


Fig. 1.

Fig. 2.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## FLUID-SEALED VALVE.

934,447.

Specification of Letters Patent. **Patented Sept. 21, 1909.**

Application filed February 14, 1907. Serial No. 357,242.

*To all whom it may concern:*

Be it known that I, HENRY I. LEA, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Fluid-Sealed Valves, of which the following is a specification.

This invention relates to gas valves and has for an object the production of a valve of simple construction and which is durable and effective in operation.

A further object is the production of a two-way valve in which means are utilized for closing and water sealing one of the outlet ports when the other is open.

A further object is the production of a water cooled valve in which the water utilized in cooling the valve is also utilized for water sealing the outlet ports.

These and other objects I attain in an apparatus embodying the features herein described and illustrated.

In the single sheet drawing accompanying this application, Figure 1 is a sectional elevation of a valve embodying my invention; and, Fig. 2 is an elevation of a detail of my invention.

The valve illustrated as embodying my invention is adapted to be operated in connection with gas producers, although I wish it to be understood that I do not limit its application to such a use, nor do I wish to limit myself to the specific construction nor to the arrangement of parts shown.

Referring to the drawings: A valve casing, which consists of a cylindrical portion 3 and head portions 4 and 5, secured thereto in any suitable manner, incloses a reciprocable valve 6. The cylindrical portion of the valve casing is provided with a flanged inlet port 7, which communicates with a source of gas supply, and the head portions 4 and 5 are respectively provided with flanged outlet ports 8 and 9, which are adapted to be connected to gas delivery passages.

The valve 6 is connected by a link 11 to an arm 12, which is provided with a pin 13, rotatably mounted in a portion 15 formed integrally with the flange 14 of the port 8. The arm 12 extends through a slot 16, formed in the portion 15, and is arranged to move the valve 6 to close either one or the other of the outlet ports. The arm is also provided

with a shiftable counterbalancing weight 17, which may be moved longitudinally of the arm and locked in various positions along it.

A downwardly projecting flange 18, formed integrally with the head portion 4, extends into the valve casing and, when the valve 6 is raised to close the port 8, (as shown in Fig. 1) coöperates with a cup 19, formed on the valve by an annular flange 20, and forms a water seal for the port 8. The cup 19 receives water from a water supply pipe 21, which extends through the casing and delivers water through the port 8. The water overflowing from the cup 19 is received by a basin 22, which is relatively shallow and which is formed between the flange 20 and a concentric flange 23, formed integrally with the valve. A number of notches 24 are provided in the flange 23 so that the overflow water from the basin 22 will be well distributed over an annular flange 25, which is formed integrally with the valve 6 and which extends downward.

An annular flange 26 surrounds the port 9 and extends upwardly into the valve casing, thereby forming an annular basin 27. The flange 26 is located concentrically with the cylindrical portion 3 of the valve casing and is axially in line with the flange 18 of the port 8. The basin 27 receives the water discharged from the notches 24 and when the valve 6 is moved to close the port 9, coöperates with the flange 25, of the valve, to water seal the port 9.

Overflow piping 30 extends through the cylindrical portion 3 near the bottom of the valve casing and connects with a seal pot 31, which is formed by a cylindrical wall 32 and head portions 33 and 34. The flange 26 is provided with a slot 35 which is adapted to deliver water overflowing from the basin 27 into a conduit or passage 37, which also communicates through piping 38 with the seal pot 31. The pot 31 is provided with a discharge pipe 36 which extends through the head 34 into the upper portion of the seal pot, and the piping of each of the overflow connections extends through the head 33 into the lower portion of the pot. With such an arrangement gas cannot be discharged, under conditions met in practice, through the water overflows, as each is sealed by the water in the pot 31.

The two overflow connections are provided for the basin 27 for the reason that when the valve 6 is moved to close the port 9 the liquid on either side of the flange 25 will assume  
 5 a level corresponding to the relative pressure to which it is exposed; for example, if the pressure within the valve casing is greater than the pressure within the passages which communicate with the port 9, the water will  
 10 rise on the side of the flange 25 which is adjacent to the port 9 and will be depressed on the other side of the flange. The slot 35 is therefore provided to carry off the over flow water when such a condition exists and the  
 15 slot is so arranged that the overflow will not pass through the port 9.

When the pressure within the valve casing is less than the pressure in the passage communicating with the port 9, the water will  
 20 rise on the side of the flange 25 adjacent to the cylindrical portion 3 of the valve and the overflow piping 30 will be effective in discharging the overflow from the basin 27. By this arrangement a constant overflow of  
 25 the surplus water from the valve through pipe 32 of the seal pot 31 may be obtained, this overflow indicating that the water in chamber 19 and basin 27 is retained in sufficient quantity to insure immediate sealing  
 30 of the port 8 or 9, as may be desired.

Radially extending wings 40 are formed on the flange 18 and are adapted to guide the valve 6 by contacting with the inner surface of the flange 20 while the valve is  
 35 being moved to close the port 8. Radially extending wings 41 are formed integrally with the flange 25 and are adapted to guide the valve by contacting with the outward peripheral face of the flange 26 while the  
 40 valve is being moved to close the port 9.

Hand holes 42 extend through the cylindrical portion 3 of the casing and are so located that the interior portions of the valve, which are apt to collect recement material,  
 45 may be readily cleaned.

A specific application of a valve of this type may be had in producer gas practice where it is advisable at times to cause the gas leaving the producer to pass through a  
 50 purge stack into the atmosphere and at other times to pass directly from the producer to cleaning apparatus or pipe lines. In such application the gas from the producer will enter port 7. Port 8 will communicate with  
 55 the purge stack and port 9 with the cleaning apparatus or pipe lines. This valve construction renders possible the immediate and positive closing of the outlet 9 with the immediate and positive opening of outlet 8, or  
 60 vice versa, without the possibility of having

both of ports 8 and 9 either open or closed at the same time.

In the operation of this valve it is essential that the valve 6 be easily held at either  
 65 end of its throw. For this purpose arm 12 is so made that with proper adjustment of weight 17, a mere shifting of the arm 12 about its pivot will, by changing the effective lever arm of the weight 17, cause the valve 6 to remain in its upper position, 70  
 while at the other extreme of its throw the effective lever arm is so diminished that the weight of the valve 6 itself, insures its remaining in its lower position.

In accordance with the provisions of the 75 patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but  
 80 I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means; and

What I claim is:

1. In combination, a valve casing provided 85 with an inlet and two outlet ports, a valve located within said casing for closing either of said outlet ports, a liquid receptacle carried by said valve and a cooperating flange mounted on said casing for closing one of  
 90 said ports, a depending flange carried by said valve and a cooperating receptacle provided in said casing for closing the other outlet port and an overflow connection communicating with the receptacle on each side 95 of said flange.

2. In combination, a valve casing provided with an inlet port and two outlet ports, a valve located within said casing for closing one or the other of said outlet ports, a liquid 100 receptacle carried by said valve, a cooperating flange mounted on said casing for closing one of said outlet ports, a flange carried by the valve and a cooperating receptacle provided in said casing for closing the other 105 port, means for delivering sealing liquid to the receptacle of said valve, means whereby the liquid overflowing from said valve receptacle supplies the receptacle of said casing and an overflow connection for the 110 receptacle of said casing which communicates therewith on each side of said flange.

In testimony whereof, I have hereunto subscribed my name this 31st day of January, 1907.

HENRY I. LEA.

Witnesses:

CHARLES W. MCGHEE,  
 E. W. MCCALLISTER.