R. C. STOKES AND J. C. CONRAD.

REDUCING VALVE.

APPLICATION FILED FEB. 2, 1918.

1,349,443. Patented Aug. 10, 1920.

G Fig. 1

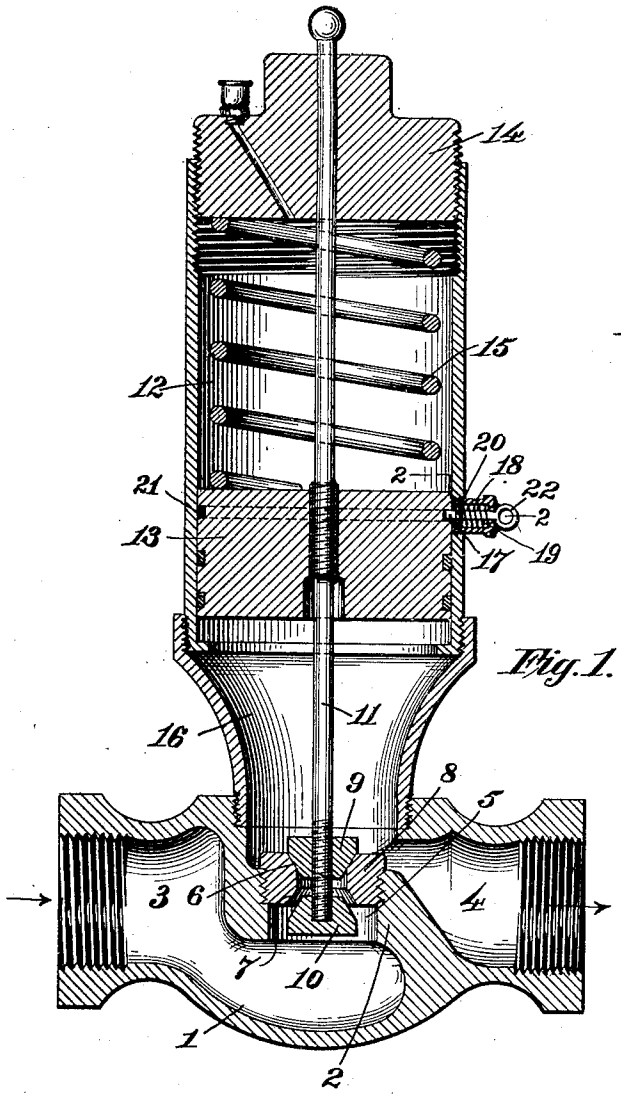


Fig. 1.

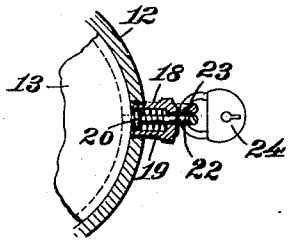


Fig. 2.

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REDUCING-VALVE.

1,349,443. Specification of Letters Patent. Patented Aug. 10, 1920.

Application filed February 2, 1918. Serial No. 215,061.

To all whom it may concern:

Be it known that we, REUBEN C. STOKES and JOSHUA C. CONRAD, citizens of the United States, residing at Cement, county of Caddo, and State of Oklahoma, have invented certain new and useful Improvements in Reducing-Valves, of which the following is a specification.

Our invention relates to valves and particularly to regulating valves. More specifically, our invention relates to valves for reducing fluid pressure and retaining the reduced pressure substantially constant.

The object of our invention is to provide an improved valve of the class mentioned which may be readily and quickly adjusted to maintain any desired pressure on the low pressure side of the device. A further object of our invention is to provide a valve of the class mentioned wherein, when the low pressure is reduced beyond a predetermined limit, the same will automatically and completely shut off the flow of gas from the high pressure side and maintain the closed position until manually operated to open the same. A further object of our invention is to provide means for locking the valve in closed position to prevent the same from being tampered with by unauthorized persons. A further object of our invention is to provide a device as mentioned which may be adapted to many of the valve casings now in use with little or no change to the latter. Other objects will appear hereinafter.

With these objects in view our invention consists generally in a valve casing equipped with a diaphragm provided with a port, high and low pressure valves adapted to close said port when moved in opposite directions respectively, a cylinder in open communication with the low pressure side of said casing a piston in said cylinder and connected to said valve, means for counterbalancing the low pressure and means for regulating the last said means. More specifically our invention comprises a device as above mentioned wherein the counterbalancing means comprises a spring interposed between the piston and a cylinder head and wherein the cylinder head is in threaded connection with the cylinder so as to vary the tension of the spring. Our invention further consists in a device as mentioned further characterized by a latch adapted to engage the piston and hold the same in depressed position with the valve closed after the valve has been closed either manually or automatically.

Our invention further consists in a device as mentioned further characterized by means whereby the said latch may be locked to prevent the valve from being opened or set into operation by unauthorized persons. Our invention further consists in various details of construction and arrangements of parts all as will be fully described hereinafter and particularly pointed out in the claims.

Our invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification and in which

Figure 1 is a vertical longitudinal section of a valve embodying our invention and

Fig. 2 is a detail view of the latch on substantially the line 2—2 of Fig. 1.

Referring now to the drawings, 1 indicates a valve casing provided with a diaphragm 2 separating the same into high and low pressure sides 3 and 4 respectively. Extending through the diaphragm 2 is a port 5, and said port is surmounted by a pair of oppositely disposed conical valve seats 6 and 7 respectively, which are preferably formed on an annular member threaded into the diaphragm 2 as indicated. 9 and 10 are conical valves coöperating with the valve seats 6 and 7 respectively and spaced apart on a valve stem 11. The valves are threaded upon the stem 11 which not only facilitates the assembling of the device but provides means whereby the distance between the said valves may be adjusted to suit the conditions with which the device is to be used.

Connected to the casing 1, and in communication with the low pressure side 4 thereof is a cylinder 12 provided with a piston 13 to which the valve stem 11 is connected. 14 is the cylinder head which is adjustably mounted thereon, preferably by being in threaded connection therewith as illustrated. The valve stem 11 is extended through the cylinder head for a purpose hereinafter described. Interposed between the cylinder head 14 and the piston 12 is a spring 15, the tension of which is normally counter-balanced by the low pressure in the portion 4 of the valve casing. The cylinder 12 is preferably connected to the casing 1 by a member 16 which is preferably in threaded connection with both the

cylinder and the casing, and by means of which the device may be adapted to any of the valve casings now in use.

Fixed to the cylinder 12 is a latch comprising a spring pressed bolt 17 and a housing 18 within which the spring 19 is arranged. The spring is interposed between the end of the housing and a collar or shoulder 20 on the bolt. The piston, near its upper end, is provided with an aperture adapted to be engaged by the end of the bolt 17, said aperture preferably being in the form of a peripheral groove 21. The outer end of the bolt is provided with an eye 22 by means of which the same may be manually retracted, and the housing 18 is provided with a similar eye 23, said eyes being adapted to receive a locking member 24 when the bolt is in position to lock the piston.

With a construction as above described, it is obvious that with the piston unlocked and fluid pressure maintained within the high pressure side 3 of the casing 1, the piston 13 will be balanced between the low pressure within the portion 4 and the counter-balance spring 15. If the pressure within the low pressure side increases, the piston will be forced upwardly closing the valve 10 and decreasing or shutting off the fluid received from the high pressure side. Decrease of pressure in the low pressure side will permit the piston 13 to drop opening the valve until the pressure decreases below the point of safety when the valve 9 will be closed to shut off all gas from the high pressure side. As the valve 9 is closed the bolt 17 engages the aperture 21 in the piston thereby preventing the valve from reopening when the pressure within the system again increases. This is essential when the device is used with gas burners, as when the pressure is reduced to such an extent as to extinguish the burners, the flow of gas is automatically cut off so that gas cannot be supplied to the unlit burners whose respective valves are open. When the pressure in the system again reaches a normal or operative degree, the device may be set into operation by merely retracting the bolt 17. The device may be adjusted to secure the desired pressure in the low pressure side by adjustment of the cylinder head 14 to vary the tension of the spring 15. By projecting the valve stem 11 through the cylinder head the valves may be manually closed whenever desired, that is, should it be desired to shut off the flow of gas, it is but necessary to depress the valve stem until the latch 17 engages the aperture 21.

We claim:

1. A device of the class described comprising a valve casing having a diaphragm provided with a port, high and low pressure valves adapted to control the passageway through said port when moved in opposite directions respectively, means for adjusting said valves relative to each other, a cylinder in open communication with the low pressure side of said casing, a piston in said cylinder and connected to said valves, a cylinder head, a spring interposed between said head and said piston and means for adjusting said head to regulate said spring, substantially as described.

2. A device of the class described comprising a valve casing having a diaphragm provided with a port, high and low pressure valves adapted to control the passageway through said port when moved in opposite directions respectively, a cylinder in open communication with the low pressure side of said casing, a piston in said cylinder and connected to said valves, and means for adjusting said valves with relation to each other and to the piston, means counterbalancing the low pressure on said piston, and means for regulating the last said means, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

REUBEN C. STOKES.
JOSHUA C. CONRAD.

Witnesses:
IRL T. ECHOLS,
R. A. NICHOLS.