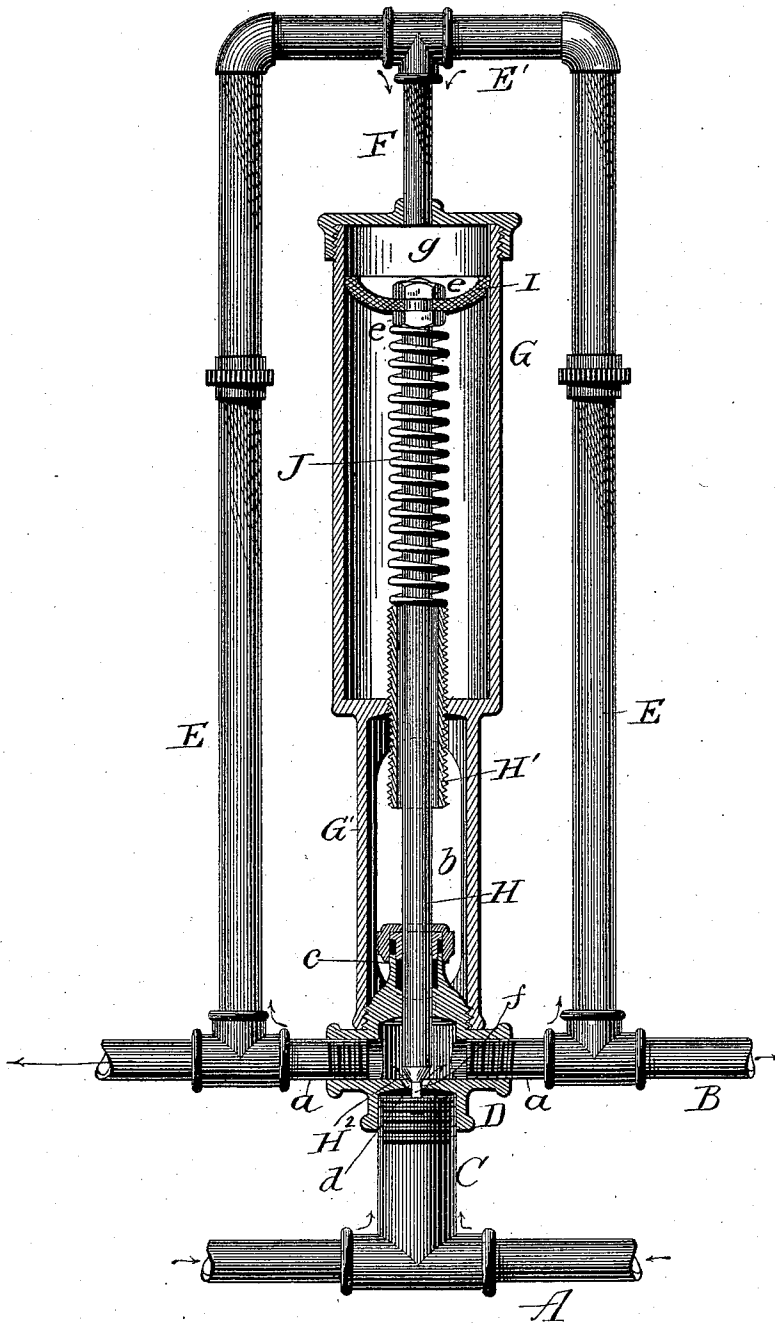


(No Model.)

J. WILSON.
FLUID PRESSURE REGULATOR.

No. 530,872.

Patented Dec. 11, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES WILSON, OF JACKSON, OHIO, ASSIGNOR OF ONE-HALF TO C. A. MULLEN, OF SAME PLACE.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 530,872, dated December 11, 1894.

Application filed January 20, 1894. Serial No. 497,518. (No model.)

To all whom it may concern:

Be it known that I, JAMES WILSON, a resident of Jackson, in the county of Monroe and State of Ohio, have invented certain new and useful Improvements in Fluid-Pressure Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in fluid pressure regulators, and more particularly to such as are adapted for use in regulating the pressure of gas on lines or conduits,—the object of the invention being to construct a gas supply regulator in such manner that it shall operate automatically to effectually regulate the pressure of gas on lines or conduits,—said regulator being so constructed and arranged that in case of extreme weakness of the main supply, the entire amount of gas will be delivered to the low pressure pipe.

A further object is to produce a gas regulator which shall be positive and instantaneous in action, with no lost motion in its parts to cause delay and allowing no perceptible increase of pressure on the low pressure line.

A further object is to produce a gas regulator which shall be simple, cheap, and durable in construction, not liable to become damaged and one which shall be effectual in every respect, in the performance of its functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth and pointed out in the claims.

The accompanying drawing is a vertical sectional view illustrating my improvements.

A represents the main supply or high pressure pipe and B the low pressure pipe. A short pipe C communicates at one end with the pipe A and at its other end with a coupling D, which latter communicates at its ends with adjacent sections *a, a*, of the low pressure pipe. Pipes E, E, communicate with the low pressure pipe B at opposite sides of the coupling D, and the other ends of said pipes

E are connected by a cross pipe E', thus producing a by-pass.

The object of employing the two pipes E, E, instead of one is that in the event of any accident to the main or high pressure line whereby the supply of gas to the low pressure line might be cut off, thereby allowing all the contents of the low pressure line to escape, it would also allow the contents of the upper end of the cylinder above the piston, which is the controlling power, to escape. Then when obstruction to high pressure line has been removed so as to permit gas to flow freely through the regulator again into the low pressure line, the object is to control this flow instantaneously, and as two pipes will deliver twice as much as one in same period of time it follows that the space above the piston will be refilled twice as quick as if only one pipe had been used.

At a point between the ends of the cross pipe E', a short pipe F communicates therewith at one end and at the other end said pipe F communicates with one end of a cylinder G. The cylinder G is supported on a bracket G' having an opening *b*, and said bracket is secured to and supported by the coupling D. Within the bracket G' a stuffing box *c* is located, through which a valve stem H passes, the lower end of said stem constituting a valve H² adapted to rest on a valve seat *d* in the coupling D, the movement of the valve to and from the valve seat being intended to regulate the flow of gas from the main supply pipe A to the low pressure pipe B, thus regulating the pressure in the latter. The valve H² will be guided in its movements by a projection *f* adapted to pass through the opening in the valve seat. The stem H projects through a sleeve H' located in one end of the cylinder G, said sleeve being screw-threaded exteriorly to mesh with threads in the perforations in the end of the cylinder and the bracket G' through which it passes, whereby it can be adjusted for a purpose presently explained.

The stem H terminates at a point near the upper end of the cylinder G, where it is provided with a cup-shaped piston I, secured thereto by means of nuts *e, e*. This cup-

shaped piston is made of rubber, leather or other suitable material and is adapted to bear snugly against the interior wall of the cylinder. A spring J encircles the stem H, said spring bearing at one end against the piston I and at the other end on the adjustable sleeve H'. The spring J is thus adapted to maintain the valve H² entirely open when the pressure in the main pipe A is as low as it is desired that the pressure in the low pressure pipe B shall be, so that the flow of gas (under these conditions) from the main supply pipe A to the low pressure pipe B shall be unobstructed. By means of the adjustable sleeve H' (which is readily accessible through the opening b in the bracket G'), the tension of the spring J can be easily and quickly adjusted, so that when the gas in the main supply pipe A is at a certain predetermined pressure, the flow of gas from said main supply pipe to the low pressure pipe will be unobstructed. Now when the pressure in the low pressure pipe exceeds the amount desired, (the pressure in the space g above the piston I being equal to the pressure in the low pressure pipe,) the piston I will be moved by the pressure of the gas upon it, against the resistance of the spring J, and quickly close the valve H², thereby closing the supply of gas from the main supply pipe to the low pressure pipe. When the gas in the low pressure pipe again approaches the normal low pressure, the valve will begin, automatically, to open and in this manner, the pressure in the low pressure pipe will be automatically maintained constantly normally low.

By making the piston I cup-shaped as above explained, it will be seen that the gas will enter the same and force its periphery into proper contact with the interior wall of the cylinder, and prevent the leakage of gas past it. The normal contact of the piston I with the wall of the cylinder when the pressure against it is low or normal, is sufficient to prevent the leakage of gas, but it is evident that if the piston be fitted normally tight enough to prevent leakage under high pressure, the frictional contact of said piston against the wall of the cylinder would be unduly great. By means of my improved form of piston, the

frictional contact thereof against the wall of the cylinder will be commensurate with the pressure of gas against, the greater the pressure the greater will be the frictional contact of said piston with the wall of the cylinder. 55

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope and hence I do not wish to limit myself to the precise details of construction herein set forth. For instance the mechanism can be reversed by changing the positions of the piston, spring, valve and valve seat, but, 60

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is— 65

1. In a fluid pressure regulator, the combination with a main supply pipe, a low pressure pipe adapted to communicate therewith and a valve between said pipes, of a by-pass at a point between its ends communicating with the low pressure pipe at two points, a cylinder communicating with said by-pass at a point between its ends, a piston in said cylinder and connected directly with said valve, and a spring adapted to maintain said valve open when the pressure on said piston is sufficiently low, substantially as set forth. 75

2. In a fluid pressure regulator, the combination with a main supply pipe, a low pressure pipe a short pipe connecting the two together and a valve seat in the connecting pipe, of a by-pass communicating with the low pressure pipe at two points on each side of the connecting pipe, a cylinder communicating with said by-pass, a piston in said cylinder, a piston rod or stem secured to said piston and adapted at its opposite end to constitute a valve to rest on said valve seat, a spring tending to normally open said valve, and means for adjusting the tension of said spring, substantially as set forth. 80

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 95

JAMES WILSON.

Witnesses:

JOHN H. MCCOY,
WM. HILLING.