

(No Model.)

M. G. WILDER.  
PRESSURE REGULATOR.

No. 332,768.

Patented Dec. 22, 1885.

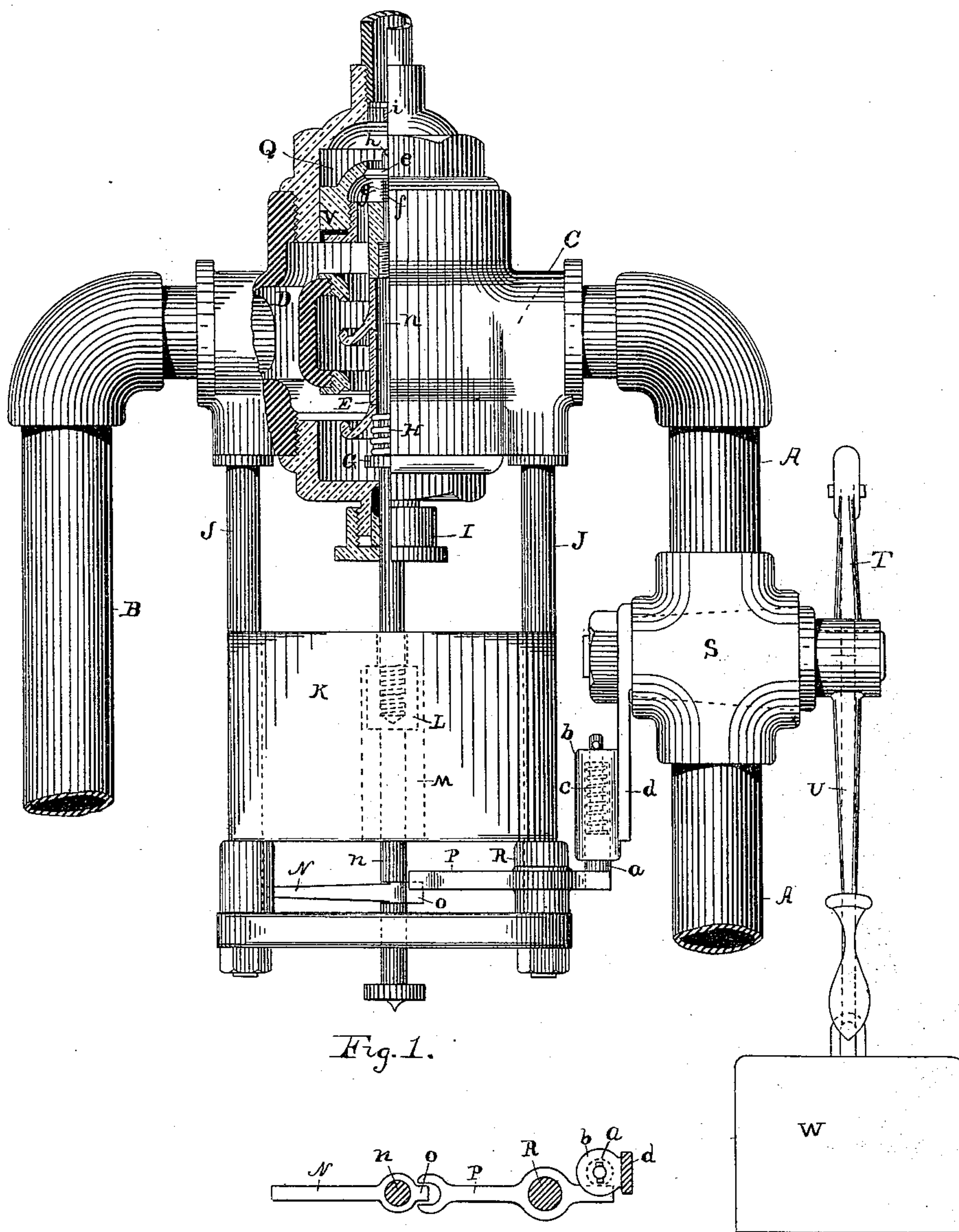


Fig. 1.

Fig. 2.

WITNESSES:

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*Moses G. Wilder*  
*by his attorney*  
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# UNITED STATES PATENT OFFICE.

MOSES G. WILDER, OF PHILADELPHIA, PENNSYLVANIA.

## PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 332,768, dated December 22, 1885.

Application filed February 26, 1885. Serial No. 156,061. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES G. WILDER, a citizen of the United States, and a resident of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification.

The object of my invention is to provide a device for regulating the pressure and supply of gases or fluids under pressure, so as to diminish the supply under an increase of pressure and to increase the supply under a diminution of pressure.

My invention is furnished with an automatic device by means of which the supply of gas or fluid will be completely shut off from entering the outlet-chamber should the pressure in this chamber become so great as to be dangerous and liable to cause leakage or rupture in the pipes through which the gas or fluid passes after having left the regulator. This excessive pressure might occur in several ways—for instance, by imperfect joints in or through some accident happening to the working parts of the device, so as to cause leakage past the balanced valve.

In addition to the shutting off of the entire supply of gas to the regulator, I have also furnished my invention with a relief-valve which, when the pressure becomes too great, so as to close the stop-valve, will be opened, allowing an escape of the gas or fluid sufficient to reduce the pressure to the predetermined point.

My present invention is an improvement in an invention for which Letters Patent were granted me September 30, 1879, No. 220,202. This invention was designed for regulating the passage of gases or fluids which were under a low pressure, my present invention being more particularly designed for regulating them when under a high pressure.

It will be evident that the improvements herein described can also be combined with the regulator shown in the above-mentioned patent.

In the accompanying drawings, Figure 1 is partly a vertical central section and partly a front elevation of my invention; Fig. 2, a plan of the levers for operating the stop-cock.

Similar letters of reference indicate similar parts throughout the several views.

Referring to Fig. 1, A is the inlet-pipe; B, the outlet-pipe; C, the inlet-chamber; D, the outlet-chamber; E, a balanced valve interposed between the chambers C and D. *n* is a rod upon which the valve E is carried; G, a collar upon this rod; H, a helical spring bearing against this collar and the valve. I is a gland through which the rod *n* passes. J J are guides secured to the outer shell or casing of the device. K is a weight through which the guides J pass. L (shown by dotted lines) is a collar, and M a hole, the former on *n* and the latter in K. V is a piston secured to the upper end of *n* and working in a cylinder, Q. N is a lever on rod *n*. O is a nose on this lever. P is a lever centered at R, with a bifurcated end at O. *a* is a pin passing through a casting, *b*, the lower end of *a* resting against the end of P. *d* is an arm which connects *b* with the stop-cock S, which is of the ordinary construction, and situated on the inlet-pipe A. T is a handle on the stop-cock S; U, a cord or chain attached to the upper end of this handle, and W a weight at the lower end of U.

The operation of this device is as follows: The gas passes from A into C, through the valve E into D, and from thence into the outlet-pipe. As the pressure in A is much greater than is desired in B, it must be reduced. E is a balanced valve; *n*, the spindle of this valve, attached at its top to a piston, V, and at its bottom to a weight, K. This weight K is so arranged as to exert a downward pressure on the valve E equal to that which would be exerted by the gas or fluid against the piston V when the said gas or fluid was at the proper pressure in the chamber D. In other words, the pressure in D and the weight of K should balance each other. If the pressure in D becomes too great, the piston V is lifted and the valve E is closed to an extent corresponding to the increase of pressure in D. If, now, the valve E is entirely closed, and, owing to leakage or some other cause, the pressure continues to increase in D, the piston V will be still farther raised, compressing spring H, lifting the nose O of N out of the bifurcation in the end of P. When this is done, the weight W will fall and the cock S will be closed.



The closing of this cock prevents any passage of the gas or fluid until said cock has been opened by hand. The weight W, and also the weight K can be replaced by suitable springs, in  
 5 which case the springs shown in my patent referred to above could be used, instead of using the spring or weight below the regulator, as described above. If it is desired at any time to close S without waiting for an automatic  
 10 closing, it is only necessary to lift the pin *a* out of contact with P, and the cock may be turned without disturbing any other part of the device. The spring *c* returns and holds the pin *a* in its normal position.

15 I have hereinbefore mentioned a relief-valve for allowing an escape of superfluous gas or fluid from the chamber D. I have placed this valve *e* directly over the rod *n*. *f* is the stem of this valve. *g* is a spring around *f*. *h* is a  
 20 projection from the top of *e*. *i* is a stop situated at the top of the cylinder Q and above *h*. When, owing to an excessive pressure of gas or fluid in D, the piston V is raised to a considerable height, *h* will strike *i*, and any further raising of V will cause *e* to be slightly  
 25 opened, and allow the escape of the superfluous gas or fluid. If the valve *e* were large enough, all the gas or fluid in D would escape when it was opened, and hence there would be  
 30 no cause for the operation of the mechanism previously described for shutting S. It would be wasteful and undesirable to have *e* so constructed, and hence it is small and only intended to relieve the pressure in D due to  
 35 leakage or to reduce the pressure after the stop-valve has been closed.

In this improvement, as in my patent of 1879, the rod *n* passes freely through the valve

E and does not restrain it from lateral displacement to a degree which will allow the  
 40 valve to come to a perfect seat when expansion, wear, or imperfect workmanship have caused a change in alignment of the cylinder and valves.

In case it is for any reason desired to automatically close the stop-valve S when the  
 45 pressure in the supply-pipe is reduced below a predetermined point, the device shown in Fig. 1 causes the valve to close by a movement of the piston V downward. This downward  
 50 movement carries the nose O of N out of the bifurcated end of P, and the rest of the operation is similar to that already described.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of rod *n*, weight W, pressure-regulating valve E, piston V, and nose O, by means of which the automatic cut-off is released and the flow of gas stopped by  
 55 an increase of pressure beyond a predetermined degree, substantially as described.

2. The combination of rod *n*, weight W, pressure-regulating valve E, piston V, and nose O, by means of which the automatic cut-off is released and the flow of gas stopped by  
 60 a decrease of pressure below a predetermined degree, substantially as described.

3. The combination of rod *n*, piston V, lever O, lever P, pin *a*, arm *d*, valve S, handle T, chain or cord U, and weight W, substantially  
 70 as and for the purposes described.

MOSES G. WILDER.

Witnesses:

OTIS EGAN,

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