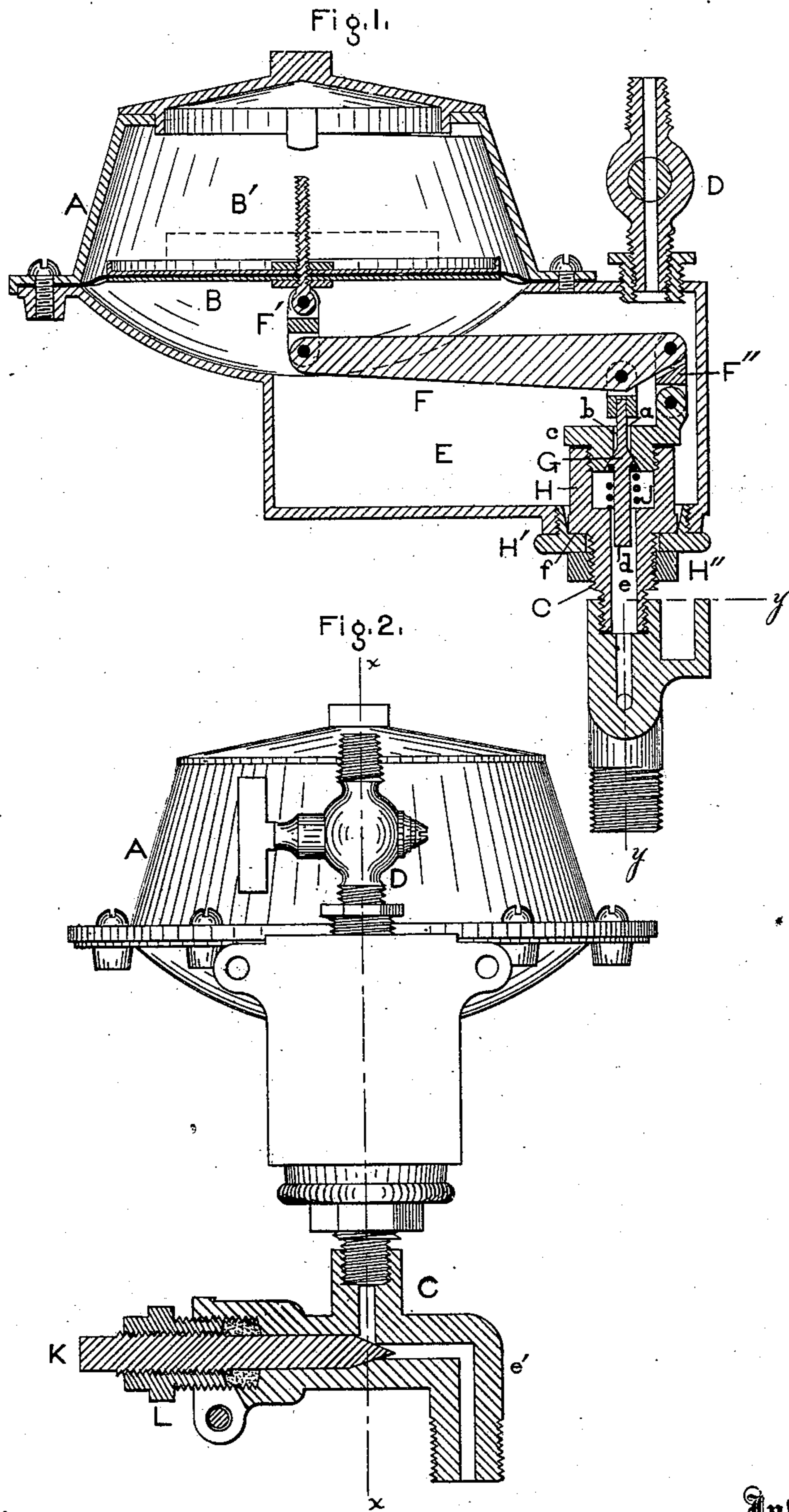


J. M. FOSTER.
Gas-Pressure Regulator.

No. 227,234.

Patented May 4, 1880.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN M. FOSTER, OF PHILADELPHIA, PENNSYLVANIA.

GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 227,234, dated May 4, 1880.

Application filed August 18, 1879.

To all whom it may concern:

Be it known that I, JOHN M. FOSTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and
5 useful Improvement in High-Pressure Gas-Regulators, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of
10 the regulator embodying my invention in line *x x*, Fig. 2. Fig. 2 is a transverse vertical section in line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

15 My invention relates to a regulator or governor for controlling the flow and regulating the pressure of gas delivered for consumption from reservoirs containing it in a compressed state, and particularly adapted for use on rail-
20 way-cars, steamboats, &c.

The object of the invention is to provide a sensitively-acting and compact regulator which, under all circumstances, shall be absolutely safe and free from danger in its operation, so
25 that in case of accident—the wrecking of the car or overturning of the same—or in the event of any of the connections between the valve and diaphragm being broken or the regulator being inverted, the flow of gas will be automatically cut off and all danger attending the escape of gas in the car prevented. This is attained through the agency of a valve having its larger surface exposed to the gas under full pressure and closing in the direction
30 of the flow of the gas, a coiled spring encircling the stem of said valve, which is used for the double purpose of steadying the valve and preventing “chattering” or vibration, and for equalizing the pressure on the under side
35 of the valve as the gas-pressure at the source of supply diminishes, a weighted diaphragm, and an intermediate lever for automatically controlling the delivery of the gas at a uniform point.

45 Referring to the drawings, A represents a casing, having a weighted diaphragm, B, a diaphragm-chamber, B', inlet C for gas or air, outlet D, and offset or chamber E for the lever F. On the stem passing through the center
50 of the diaphragm is attached a link, F', by its

upper end to a joint, upon which it turns freely, and is similarly connected at its lower end to the lever F, having a fulcrum on the link F'', which is jointed to a cap, *c*, of the valve-chamber; and said lever sustains, by a
55 link, the stem of a valve, G, which valve closes upwardly, the chamber H whereof, called the “high-pressure chamber,” being secured to the base of the casing A in the offset portion or chamber E, and communicating with the inlet
60 C. The stem *a* passes through an opening, *b*, in the cap *c* at the top of the valve-chamber H, said opening being of greater diameter than the stem of the valve; or the stem may be squared, winged, or grooved, the object be-
65 ing to permit the passage of the gas from the chamber H into the casing A. The seat of the valve is on the under side of said cap *c*, and the stem is prolonged from the valve, as at *d*, said prolongation entering the neck *e* of the
70 shell of the valve-chamber H, and having its end or butt exposed to the pressure of the inflowing gas, the bore of the neck being greater than the diameter of the prolongation *d*; or the latter may be squared, winged, or grooved,
75 the object being to permit the passage of gas through the neck *e* into the valve-chamber.

The prolongation *d* is encircled by a short coiled spring, J, which rests against the base of the valve-chamber H, and is of such length
80 that it exerts its pressure only when the valve G is lowered or opened, in which case the valve comes in contact with the upper end of the spring and compresses it.

K represents the valve of the inlet C, consisting of a threaded spindle, which passes through and engages with the threads of a nut, L, whose exterior is also threaded to engage with the shell of the valve.

By rotation of the spindle the gas or air entering at the branch *e* is cut off or let on, as is evident, and the nut L may be held in position and a tight joint produced between it and the shell by splitting the shell and employing a screw-bolt to clamp the split portions against
95 the nut.

It will be seen that as the gas leaves the inlet C it exerts a high pressure on the butt or end of the valve-stem, and, reaching the casing A, exerts a lower pressure on the dia-
100

phragm, which is weighted, as has been stated, the weight being adjusted relatively to the flow of gas to be maintained.

When the pressure decreases in the reservoirs the weight of the diaphragm would carry the lever downward in excess of what would be required at the place of consumption or service were it not that the spring J exerts its pressure on the valve and restrains the descent of the lever.

The area of the valve exposed to the high pressure, as well as the area on the diaphragm exposed to the low pressure, together with the action of the coiled spring against the bottom of the valve, is so adjusted as to size and strength that a certain weight on the diaphragm secures a uniform pressure at the point of delivery, while the pressure in the supply-tanks may vary from three hundred pounds down to one pound to the square inch, or the number of burners in use varied to any extent.

The removal of the weight from the diaphragm, which may be caused by the overturning of the car in which it is placed, will

cause the valve to close instantly, thus preventing the escape of gas.

The lever, valve, and valve-chamber are inserted into chamber E from below through an opening therein, and secured in place by a screw-cap, H', and a binding-nut, H'', the chamber H resting by its shoulder or seat upon the said screw-cap.

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

The improved high-pressure gas-regulator described, composed of a weighted diaphragm, a lever loosely jointed thereto by means of a single link, and having a double-hinge fulcrum at the other end on the valve-chamber, and a spring-sustained valve jointed to said lever between its ends and closing in the direction of the flow of the gas, substantially as described.

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Witnesses:

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