(No Model.)

J. F. McELROY.

REGULATING VALVE.

No. 428,932. Patented May 27, 1890.

Fig. 1.

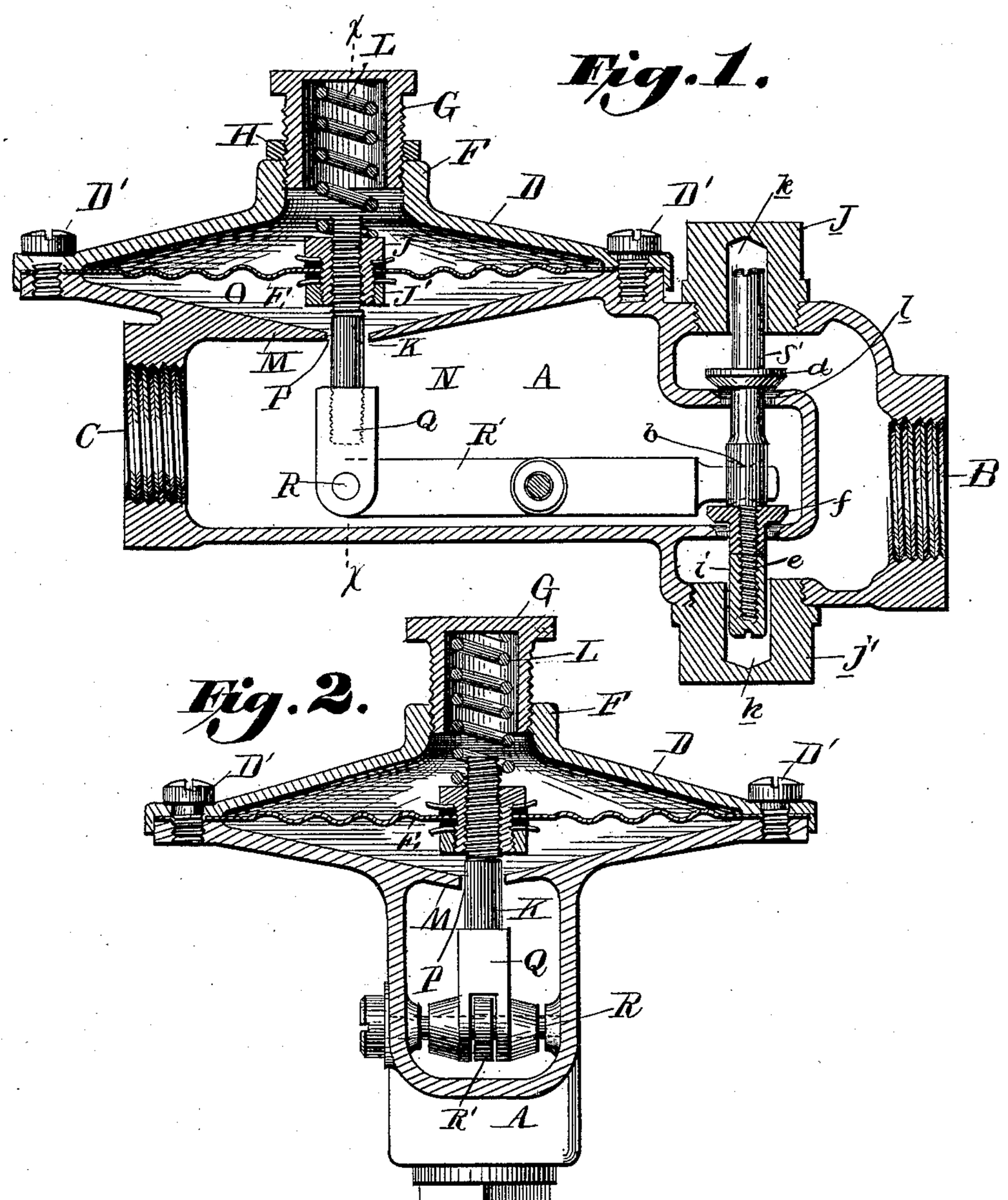
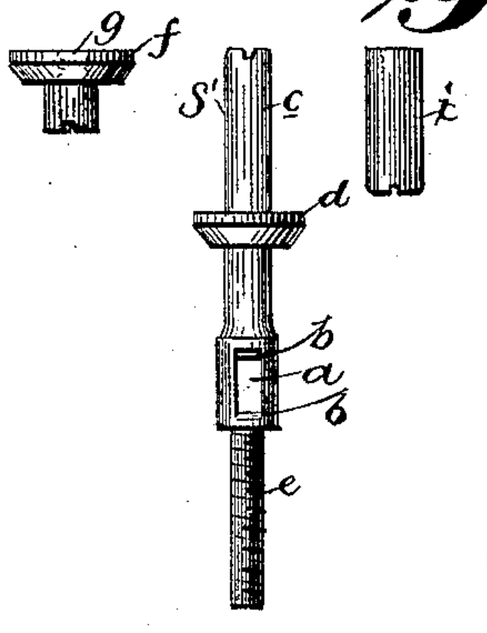


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR HEATING COMPANY, OF WHEELING, WEST VIRGINIA.

REGULATING-VALVE.

SPECIFICATION forming part of Letters Patent No. 428,932, dated May 27, 1890.

Application filed September 27, 1889. Serial No. 325,283. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. MCELROY, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Regulating-Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in pressure-regulators; and the invention consists in the novel construction and arrangement of the parts, whereby the merits of the device as a steam-pressure regulator are greatly improved, all noise from undue vibration of the diaphragm is avoided, and the parts are more easily applied, repaired, and adjusted, all as more fully hereinafter described.

This invention is intended to form an improvement upon Letters Patent of the United States, No. 410,178, issued to me on the 3d day of September, 1889.

In the accompanying drawings, Figure 1 shows my device in vertical central section. Fig. 2 is a cross-section thereof on line *x x*. Fig. 3 shows in elevation the parts of the balanced valve and stem.

The casing consists of the tubular portion A, provided at opposite ends with suitable pipe-connections B and C, and of the diaphragm-valve casing D, the two parts of the casing being secured together at their edges by suitable bolts D′, the diaphragm E being clamped between.

The casing D is provided centrally with the upwardly-projecting boss F, which is interiorly screw-threaded to receive the hollow adjustment-nut G, which is adjustably located in position by a jam-nut H.

In the center of the diaphragm is adjustably secured, by means of the nuts and washers J and J′ respectively, the screw-threaded stem K.

L is a regulating-spring interposed between the adjusting-nut and the diaphragm.

The casing is divided by the flange M into two chambers, the lower tubular chamber N and the upper diaphragm-chamber O, the only connection between them being through the aperture P, through which the stem K passes, a slight space being left around the sides of the stem to permit the passage of the steam through said aperture P in small quantities. The lower end of the stem is screw-threaded and engages into the socket-piece Q, which is bifurcated at its lower end and provided with a suitable aperture to pivotally engage with the bolt R, which is secured in suitable bosses on the interior of the tubular portion A. Between the bifurcations of the socket-piece Q and pivotally engaging upon the bolt R is the lever R′, which is pivoted at or near its central part upon the bolt, and at its forward end engages into the aperture *a* in the stem of the valve S′. This aperture is cut away from the center to both sides, forming a central ridge *b*, which has bearing upon the end of the lever R′. This valve-stem consists of the upper portion *c*, carrying the upper valve *d*, and in which is the aperture *a* and the lower screw-threaded portion *e*. *f* is a lower valve, which has a centrally screw-threaded aperture *g*, adapted to engage upon the screw-threaded portion *e* of the valve-stem. *t* is a socket-piece or nut-lock. This socket-piece is suitably screw-threaded to engage upon the portion *e* of the valve-stem, and act as a lock-nut to hold the valve *f* in its adjusted position.

The casing A is provided above and below the balanced valve with suitable plugs *j* and *j′*, which are provided with central apertures *k* and *k′*, in which freely slide the upper and lower ends of the valve-stem, being guided therein in a vertical position, so that the valves will seat themselves upon the valve-seats *l* in the partition M.

In previous constructions of such valves it has been found that where the steam had free access to the diaphragm it would cause a great vibration thereof, which would make a loud and unpleasant noise, making the device impracticable for ordinary purposes. To overcome this vibration I have arranged the partition M, having the aperture P, and whereby the steam is admitted against the diaphragm only in an annular passage around the stem K. This allows of the full steam-pressure being brought to bear upon the diaphragm, so that by its action it will open or close the balanced valve, admitting more or less steam

through the valve, at the same time preventing any possibility of the diaphragm vibrating, as but an even pressure can be obtained therein owing to the size of the aperture.

By constructing the aperture *a* in the valve-stem with ridges, or having sharp edges bearing against the end of the lever, the smallest amount of friction is had in the action of the valve up or down, the valve being held in its vertical position by being guided in the apertures *k* and *k'* in the plugs.

The spring L normally holds the balanced valve open. The tension of this spring may be suitably adjusted by means of the tension-nut G, and the position of the valve *d* may be raised or lowered to the diaphragm by screwing the stem P up or down in the socket-piece Q, at the same time turning the plugs *j* and *j'* correspondingly, so that the diaphragm will be in the normal position.

The lower valve may be regulated to or from the upper valve by screwing it up or down upon the screw-threaded portion *b*.

What I claim as my invention is—

1. In a regulating-valve, the casing, having a steam and diaphragm chamber therein, and connected by a restricted opening, of a diaphragm E, having a central opening, a threaded stem K, passing through said opening in the diaphragm, a nut J and a washer J', respectively above and below the diaphragm on the stem, a spring on the stem, a screw-threaded socket-piece Q, in which the stem is adjustably secured, a horizontal lever R', to which the socket-piece is pivoted, and a reciprocating valve-stem having valves on its opposite ends loosely mounted on and actuated by the lever, substantially as described.

2. In a regulating-valve, the combination, with the casing having a steam and diaphragm chamber connected by a restricted opening only, of the spring-controlled diaphragm adjustably connected to the stem K, the socket-piece Q, lever R, pivotally connected with the valve-stem S', having aperture *a*, screw-threaded portion *e*, upper valve *d*, lower adjustable valve *s*, and nut *i*, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 17th day of September, 1889.

JAMES F. McELROY.

Witnesses:
EDWIN A. SMITH,
THOS. C. MURRAY.