(No Model.)

H. D. W. GIBSON.

PRESSURE REDUCING VALVE.

No. 502,434. Patented Aug. 1, 1893.

Fig. 1.

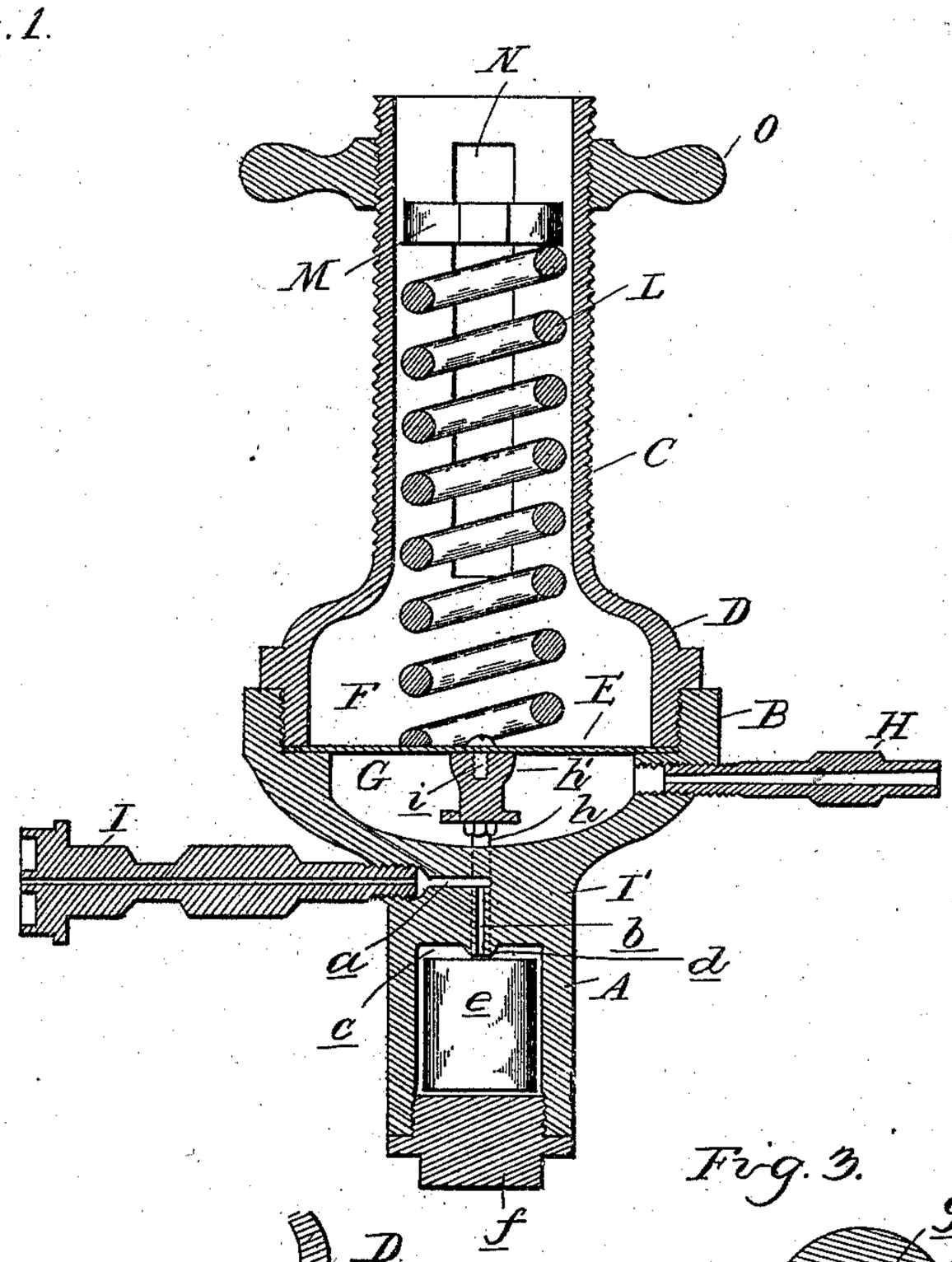


Fig. 2.

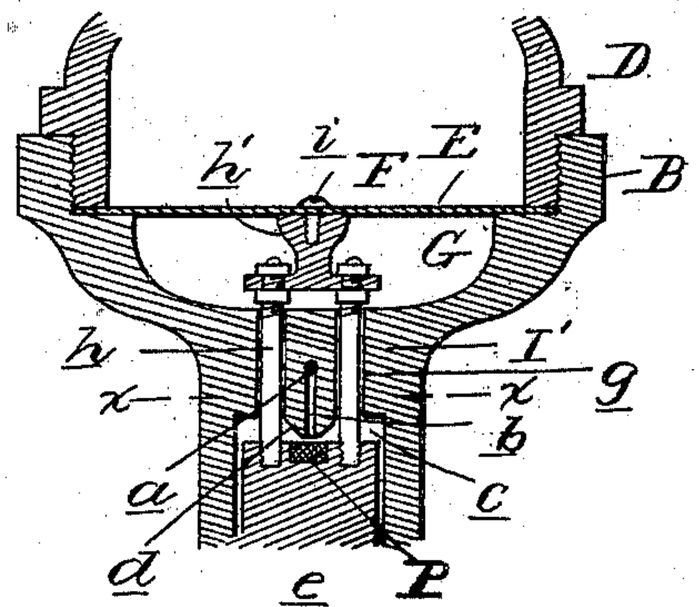
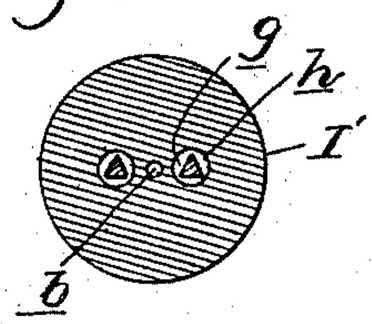


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

HOUDD D. W. GIBSON, OF DETROIT, MICHIGAN.

PRESSURE-REDUCING VALVE.

SPECIFICATION forming part of Letters Patent No. 502,434, dated August 1, 1893.

Application filed March 27, 1893. Serial No. 467,845. (No model.)

To all whom it may concern:

Be it known that I, HOUDD D. W. GIBSON, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pressure-Reducing Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction, arrangement and combination of the various parts, as more fully hereinafter described.

In the drawings, Figure 1 is a vertical, central, longitudinal section through my improved valve. Fig. 2 is a cross section at right angles to Fig. 1, through the controlling valve. Fig. 3 is a cross section on line *x x* in Fig. 2.

The casing of the valve consists of the portion A terminating in a cup shaped end portion B and a tubular casing C terminating in a corresponding cup shaped portion D, the two heads or cup shaped sections of the casing being screw threaded together, as plainly shown in Fig. 1, and forming within an enlarged chamber, which is divided by a flexible diaphragm E into the chambers F and G. This diaphragm is held in position by being clamped between the opposing faces of the two heads.

H is an exit pipe from the chamber G.

I is an inlet nipple screwed into one side of the casing A and into the partition or body I′ thereof communicating with a cross passage way *a*, which in turn connects with the downwardly extending longitudinal passage *b* communicating into the chamber *c* at the end of the casing A.

At the end of the passage way *b* is formed a raised valve seat *d* against which the plunger valve *e* in the chamber *c* is adapted to bear. The outer end of the chamber *c* is closed by means of a screw-threaded plug *f*. The valve *e* is fitted within the chamber *c* so that the pressure may be equalized at both ends.

Leading from the chamber *c* are two passage-ways *g* on opposite sides of the longitudinal passage *b* and through these passage ways, the connecting rods *h* pass. These rods are screwed into or otherwise secured to the end of the valve *e* and at their opposite ends are adjustably connected with the bracket *h′*.

i is a screw for securing that bracket centrally to the diaphragm E, all so arranged that the movement of the diaphragm will control the movement of the valve *e*.

L is a coiled spring within the tubular casing C, bearing at one end against the diaphragm and at the other end against the cross-head M, the ends of which pass through slots N and project beyond the outside.

O is an adjusting screw engaging in an exterior screw-thread on the tubular casing C bearing on the ends of the cross-head M and adapted to put more or less pressure on the spring and through the spring upon the diaphragm.

The parts being thus constructed their operation is as follows: After the spring L is adjusted to substantially the proper tension, the fluid under pressure is admitted through the nipple I and passes through the passage ways *a b* and into the chamber *c*, thence through the passage way *g* into the chamber G where its pressure will be exerted against the diaphragm. The large area of the diaphragm against which the pressure is exerted will overcome the opposite pressure on the valve *e* and will move that valve toward the valve seat *d* restricting or stopping the flow of the fluid. I preferably insert a small disk P in the contacting faces of the valve *e*. As soon as the pressure in the chamber G has been reduced by finding exit through the nipple H, the spring will raise the valve from its seat and allow more fluid to enter. It is evident that the pressure at which fluid will pass from the holder into the reducing valve may be nicely regulated by increasing or diminishing the tension of the spring L upon the diaphragm. This valve is intended for use with fluids at very high pressure, for instance in handling carbonic acid gas in carboys, &c.

What I claim as my invention is—

In a pressure reducing valve the combination of a casing, composed of two sections having enlarged inner ends with hollow centers forming a diaphragm chamber, a threaded connection between the sections, a diaphragm

secured between the meeting edges of the sections, a tubular extension on the upper section, a spring in said extension, means for regulating the tension of the spring, a tubular extension on the lower section, a valve chamber therein, a partition between the valve chamber and the diaphragm chamber having a passage way leading from the valve chamber to the inlet of the casing and other passage ways leading from said valve chamber into the diaphragm chamber, a valve in the valve chamber, rods secured to the valve passing through the partition into the diaphragm chamber, and secured to the diaphragm, an outlet from the diaphragm chamber and a removable plug in the bottom of the valve chamber, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HOUDD D. W. GIBSON.

Witnesses:
JAMES WHITTEMORE,
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