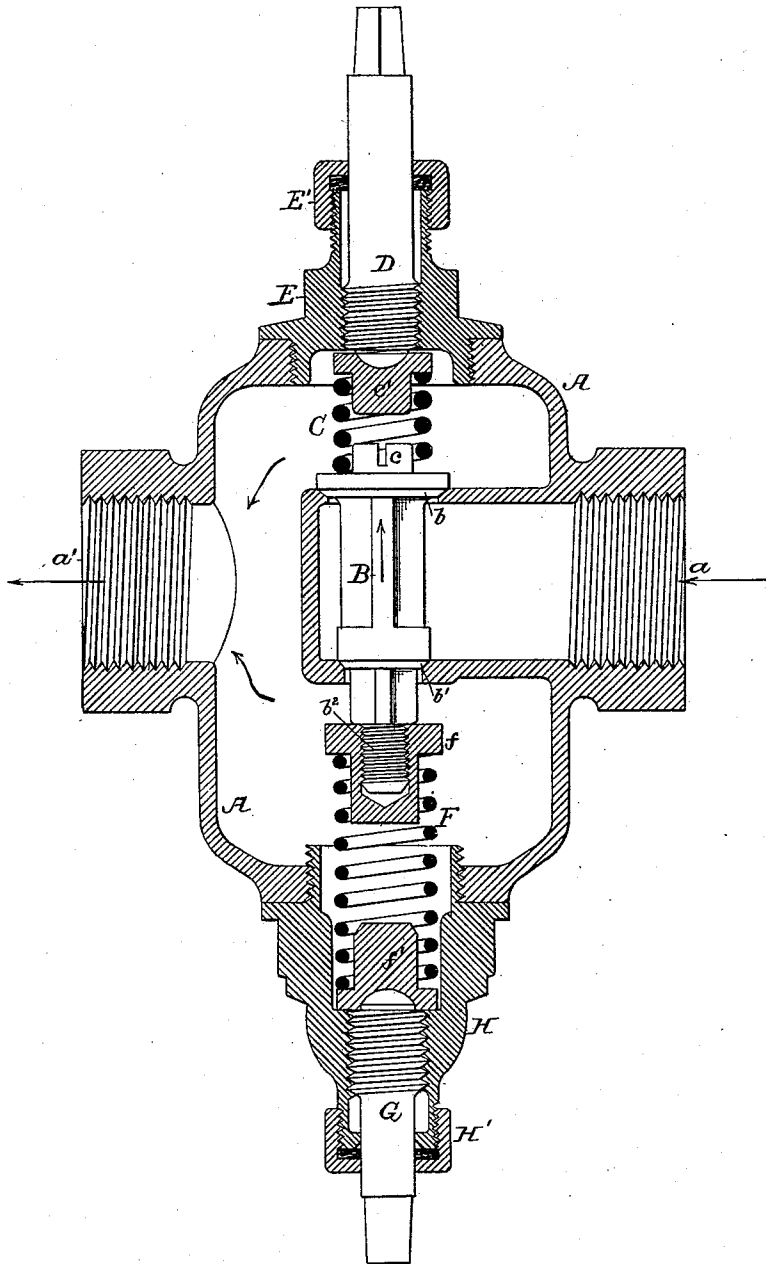


(No Model.)

J. S. McDANIEL.
REGULATING VALVE.

No. 478,939.

Patented July 12, 1892.



Witnesses:

Albert Popkin
V. E. Rodger

Inventor:
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UNITED STATES PATENT OFFICE.

JOHN S. McDANIEL, OF PHILADELPHIA, PENNSYLVANIA.

REGULATING-VALVE.

SPECIFICATION forming part of Letters Patent No. 478,939, dated July 12, 1892.

Application filed March 26, 1889. Serial No. 304,823. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. McDANIEL, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Regulating-Valves, of which the following is a specification.

The object of my invention is to construct an acceptable form of pressure-regulating valve for use in connection with steam, air, water, gas, or other fluid wherever pressure lower than the initial pressure is required, the valve being especially applicable for use on locomotive-engines for reducing the pressure of steam taken from the boiler in order to permit its use in heating the cars of the train.

The accompanying drawing represents a vertical section of my improved regulating-valve.

A is the casing of the valve; *a*, the inlet-opening; *a'*, the outlet-opening, and B the valve, which, as shown in the drawing, is duplex, having two flanges *b* and *b'*, the former of which is of somewhat larger diameter than the latter, both flanges being adapted to seats in the casing of the inlet-chamber.

Above the flange *b* of the valve is a pressure-spring C, held in place by a projection *c* on the valve and by a cap *c'*, and bearing upon the latter is an adjusting-screw stem D, which is squared at its upper end to receive a suitable handle or wrench, the screw-thread of said stem D being adapted to a threaded orifice in a cap E, secured to the casing A and provided with a stuffing-box E', which prevents leakage around the stem D.

Beyond the flange *b'* the valve B has a threaded portion *b''*, adapted to which is a thimble *f*, acted upon by a coiled spring F, which is steadied at its lower end by a cap *f'*, and bearing against the latter is a screw-threaded stem G, similar to the stem D. The spring F is by preference longer and lighter than the spring C, not necessarily, however, lighter as regards the thickness of metal employed in making the spring, as the spring may be made lighter by winding it loosely.

The threaded stem G is adapted to a threaded orifice in a cap H, which is secured to the casing A, and is provided with a stuffing-box H'.

It will be seen by referring to the drawing that steam enters at *a* and tends to open the valve or force it in the direction of its arrow by reason of the greater area of the flange *b*; but by applying sufficient pressure to the spring C above the valve to balance the boiler or initial pressure the valve will then act as a stop-valve to prevent the escape of steam. If the screw G is then manipulated so as to compress the spring F, the latter will to the extent of said compression counteract the action of the spring C and permit such an opening of the valve as will permit a flow of steam sufficient to maintain in the outlet-chamber a reduced pressure, depending upon the force exerted by the spring F. Say, for instance, the pressure in the boiler, and consequently on the valve, is one hundred pounds per square inch. By manipulating the spindle D the spring C may be compressed until it prevents the valve from rising; or, in other words, it equalizes the pressure on both sides of the valve. If steam at five pounds pressure is required at the outlet, the spindle G is turned, so as to compress the spring F and exert an upward or lifting force on the valve until the latter is opened to permit a flow of steam sufficient to cause a pressure of five pounds in the outlet-chamber. Any back-pressure that may occur will close the valve and keep it closed until the pressure is reduced to the desired limit.

My improved pressure-regulating valve can be used in connection with locomotive-engines and in places where it is impossible to use weighted valves because of the prevalence of shocks and jars which will disturb and vary the pressure of the valve.

By the construction shown the seats for the valve are so situated that the leakage will pass to the exhaust or outlet, as there is no outlet to the atmosphere from the inlet-cham-

ber except through the exhaust. Hence the usual annoyance of leakage in this class of valves is avoided.

I claim as my invention—

- 5 In a reducing-valve, the combination of the valve-casing, the inlet-chamber, valve-seats thereon, a valve-stem, two flanges or disks thereon, forming valves adapted to said seats, the two adjustable caps *c'* and *f'*, and springs
10 interposed between the valve-stem and the

caps *c'* and *f'*, with mechanism for adjusting said springs, substantially as specified.

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

JOHN S. MCDANIEL.

Witnesses:

HENRY HOWSON,
HARRY SMITH.