

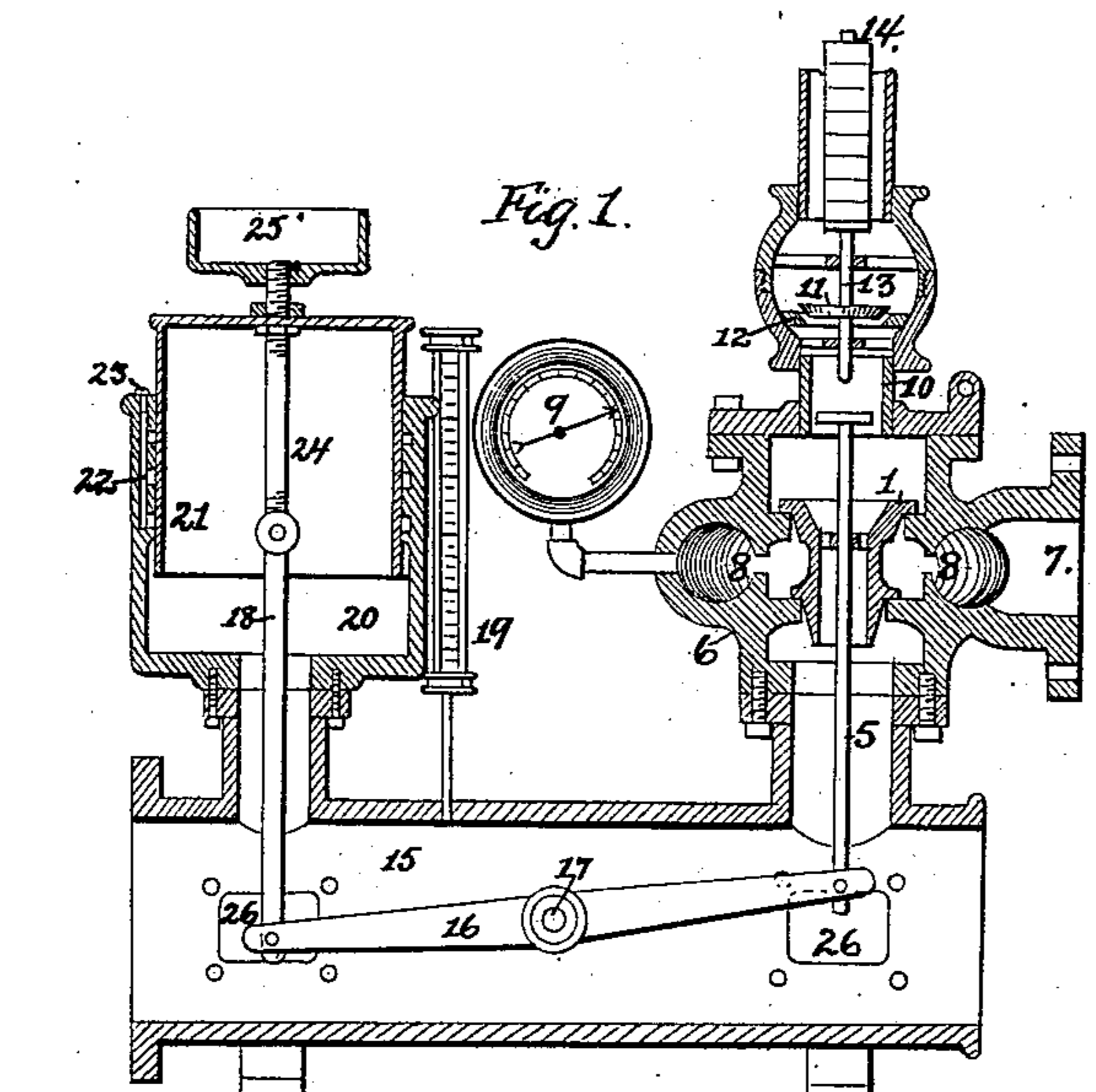
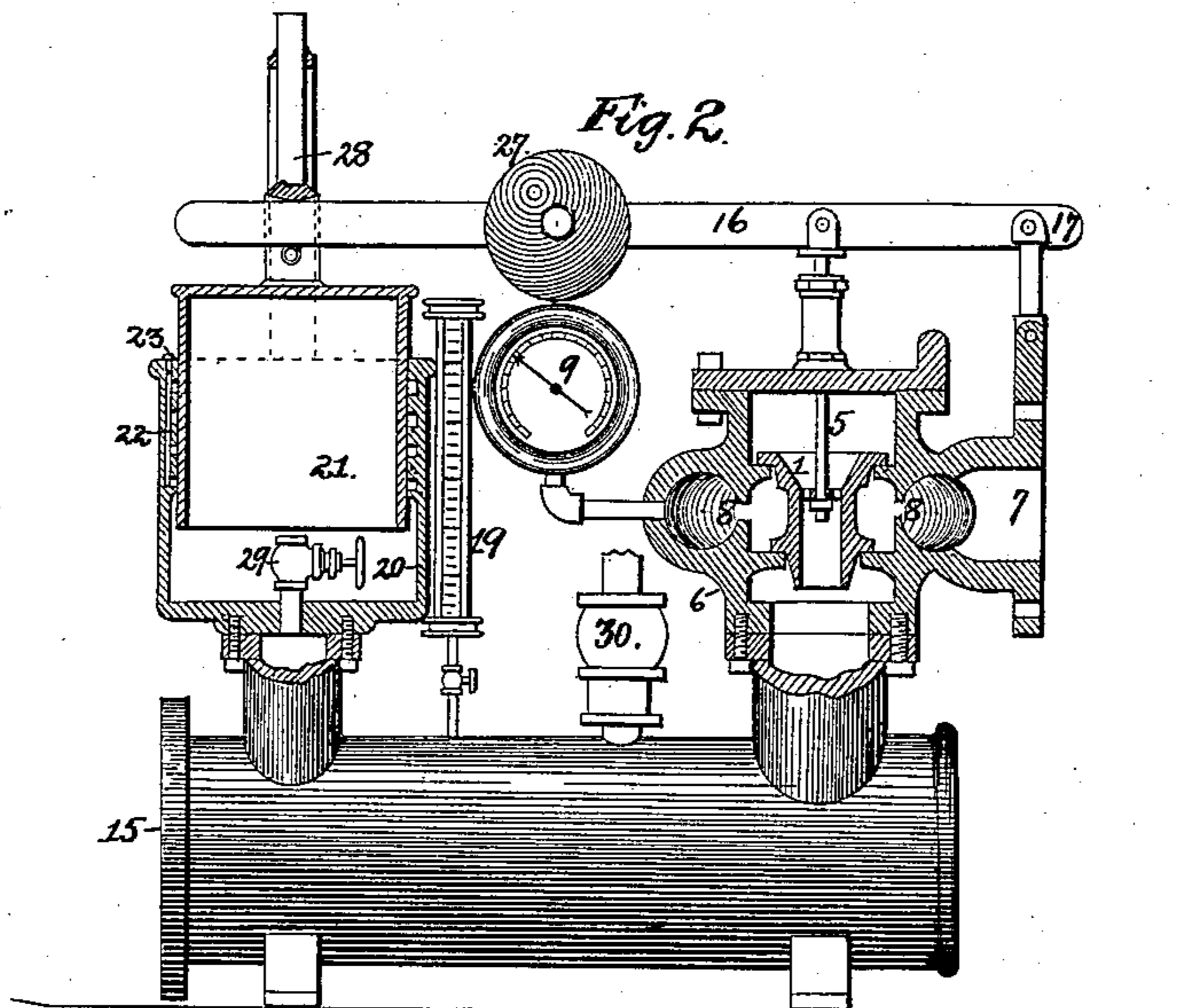
(No Model.)

J. W. RAMSEY.

FLUID PRESSURE REGULATING VALVE.

No. 352,890.

Patented Nov. 16, 1886.



Attest:

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att'y

UNITED STATES PATENT OFFICE.

JOHN W. RAMSEY, OF BEAVER FALLS, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN CORBUS, OF SAME PLACE.

FLUID-PRESSURE-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 352,890, dated November 16, 1886.

Application filed July 7, 1886. Serial No. 207,335. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. RAMSEY, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Pressure-Regulating Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My improvements, described herein, relate to fluid-pressure-regulating valves for regulating the flow of such fluids as air, gas, steam, water, and the like. Heretofore there has been granted me, April 20, 1886, a patent for a device to be used for similar purposes. The present application, however, while embodying the same principle of operation, differs structurally from said patent, and presents, besides, additional features, (which go to make up a perfect regulating-valve,) not shown by my former patent.

Further improvements upon the principle of operation of my regulating-valve are also embodied in another pending application of even date herewith, Serial No. 207,334.

The present invention consists in the following construction and arrangement of the different parts, which will first be fully set forth, and the novel points upon which I desire a patent then indicated in the claims.

Figure 1 represents a central longitudinal section of a pressure-regulator to which I have applied my improvements, and Fig. 2 represents a similar view of my improvements in a modified form.

Referring to the drawings, in which the same reference-letters indicate the same parts, 1 is a tubular puppet-valve.

6 is the cylindrical valve-chamber. 7 is the high-pressure inlet-orifice, and 8 is an annular opening surrounding the valve-chamber, communicating both with the interior of said chamber and with the inlet 7.

9 is a high-pressure indicator communicating with passage 8.

10 is an escape-pipe connected to one end of valve-chamber 6.

11 is a valve arranged in a suitable casing and adapted to work against the valve-seat 12.

13 is the valve-stem, which has an up and

down motion, being guided by winged guides. Attached to the valve-stem is a weight, 14, of any desired gravity, so as to load the valve in this instance against any ordinary pressure which the valve-chamber may contain tending to unseat it. The valve opens outwardly. Weight 14 may be made in a single piece, or may be composed of centrally-perforated disks arranged upon a central vertical spindle, or of other suitable form. Any known form of valve suitable for the purpose may be substituted for valve 11.

Valve-stem 5 of valve 1 is prolonged upwardly into escape-pipe 10, where, under certain conditions, it is adapted to contact the stem of valve 11 and unseat it. The other end of valve-chamber 6 communicates with the low-pressure pipe 15. Through the opening between the two passes the valve-stem 5, which projects into pipe 15.

16 is a rock-lever. 17 is the rock-shaft, to which the lever is fulcrumed. This shaft or pivot is supported by the walls of pipe 15 in a fluid-tight manner.

The end of stem 5 is pivoted to one end of lever 16, and the other end of said lever is pivoted to the plunger-rod 18.

19 is the low-pressure indicator. It communicates with the low-pressure pipe 15.

20 is the plunger-cylinder. It is open at one end, and at the other communicates with pipe 15 by a short connection, through which also passes rod 18. Cylinder 20 has annular recesses or corrugations, which serve as a packing between said cylinder and the plunger-piston 21.

22 is a vertical hole pierced longitudinally of the cylinder-casing. It communicates with each of the annular recesses, and serves for the admission of oil, mercury, or other lubricating or packing fluid. 23 is a screw or stop for closing the outer end of the hole.

Plunger 21 is provided with a rigid rod, 24, bolted to the plunger-head. To the bottom of this rod is pivoted the link or rod connection 18, which in turn connects with the rock-lever 16, as before described. Rod 24 is screw-threaded at its upper end where it passes through the piston-head, and is surmounted by a receptacle, 25, which may be loaded to any required degree, according to the reduced amount of pressure which the service demands,

26 are man-holes or openings, by means of which access may be had to the interior of the low-pressure pipe 15, for the purpose of adjusting the lever 16 and its connections.

5 In Fig. 2 is represented a regulating device embodying my invention in modified form. In this form the lever 16 and its connections are outside the pipe 15 and above the valve 1 and plunger-cylinder 20. Instead of a 10 weight-receptacle, 25, Fig. 1, a sliding weight, 27, traverses the lever 16. Valve-stem 5 is pivoted to lever 16, the latter being pivoted at one end and at the other end passing through a slot in a stem, 28, secured to the piston-plunger 15 21.

29 is a hand-valve placed in the entrance of the cylinder 20, leading to pipe 15, for the purpose of controlling the admission of the fluid or gas to the cylinder 20, in order to prevent 20 the undue movement of the piston 21.

30 is a safety-valve registering with the low-pressure pipe, and adapted to be set to blow off at any given pressure, thereby guarding against accidents should the regulator by any 25 possibility fail to work.

By the use of my double-seated cut-off valve I am enabled to secure improved results over the valves commonly in use for this purpose. The double seats of different areas or diameters admit of the valve being opened gradually, so that the fluid is not supplied too suddenly, and thereby causing the valve to jump or "kick." The high-pressure to be regulated is introduced between the two valve- 35 seats of the valve, and were they of the same area their action would be neutralized, and no movement would result. This valve, acting in conjunction with the connected piston, makes an exceedingly sensitive operating regulating 40 device, which is of paramount importance in a pressure-regulating valve. By the use of this peculiar valve, also, the tendency to stick on the seats from the presence of gummy substances in gas is vastly obviated.

15 In operation, the receptacle 25 of Fig. 1 is weighted, or the sliding weight 27 of Fig. 2 is adjusted, so as to cut off or regulate the supply in the pipe 15 to any degree of pressure required. The action of the regulator will not 50 be particularly described here, as the principle of operation is well known, and has been described in my former patent referred to. When, however, as shown in Fig. 2, the pressure from the high-service pipe is shut off by 55 means independent of valve 1, the plunger-piston falls and opens the valve 1 through the lever-connections between them. At the same time the upper end of valve-stem 5 strikes the stem of valve 11 and unseats it. In such conditions should there then be any leakage through 60 the high-service pipe into the valve-chamber 6 it will pass off through valve 11, thereby preventing any danger when used as a gas-regulator. The sudden turning on of the high- 5 pressure acts upon the plunger-piston, causing the regulator to at once resume its functions.

I claim—

1. In a pressure-regulator, a double-seated valve having a central passage through the valve, a piston, a valve-casing having an an- 70 nular opening into the valve-chamber, and lever and pipe connections between the valve and piston.

2. In a pressure-regulator, a double-seated valve provided with a central passage there- 75 through, and having the seats of different areas, a piston, and lever and pipe connections between the valve and piston.

3. In a pressure-regulator, a valve and an auxiliary valve arranged in operative relation 80 to the valve, whereby it is unseated when the fluid-supply is cut off.

4. A double-seated valve having a central passage therethrough, and the seats of which are of different areas, and a cone-shaped body 85 to the valve below each of the valve-seats.

5. A double-seated valve having the seats of different area, and a central passage longitudinally through the valve.

6. In a pressure-regulator, a double-seated 90 valve, a piston, a pipe connecting the piston and valve-chamber, a rock-lever located in said pipe, and rod-connections uniting said lever with the valve and piston.

7. In a pressure-regulator, a double seated 95 valve, a piston, a weight-receptacle carried by the piston, and lever and pipe connections between the valve and piston.

8. In a pressure-regulator, a double seated valve with a central passage through the valve, 100 a piston, a pipe connecting the piston and valve-chambers, a pressure-gage upon the valve, and a pressure-gage upon said pipe, and lever-connections between the valve and piston. 105

9. In a pressure-regulator, a double-seated valve, a piston, pipe, and lever-connections between the two, and a valve in the pipe leading to the piston.

10. In a pressure-regulator, a regulator- 110 valve, a piston, a pipe connecting the piston and valve-chamber, a safety-valve in the said pipe, and lever-connections between said regulator-valve and piston.

11. In a pressure-regulator, a regulator- 115 valve, a piston, a pipe connecting the piston and valve-chamber, a safety-valve in said pipe, and a valve also in said pipe at the entrance to the piston-chamber.

12. In a pressure-regulator, a valve, a pis- 120 ton, a pipe connecting the piston and valve-chamber, a rock-lever located in said pipe, man-holes in said pipe opposite said rock-lever, and rod-connections uniting said lever with the valve and piston. 125

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

JOHN W. RAMSEY.

Witnesses:

J. F. MILLER,

JNO. A. B. PATTERSON.