(No Model.) 2 Sheets—Sheet 1.

E. BADER.

FLUID PRESSURE REGULATOR.

No. 571,913. Patented Nov. 24, 1896.

Fig. I.

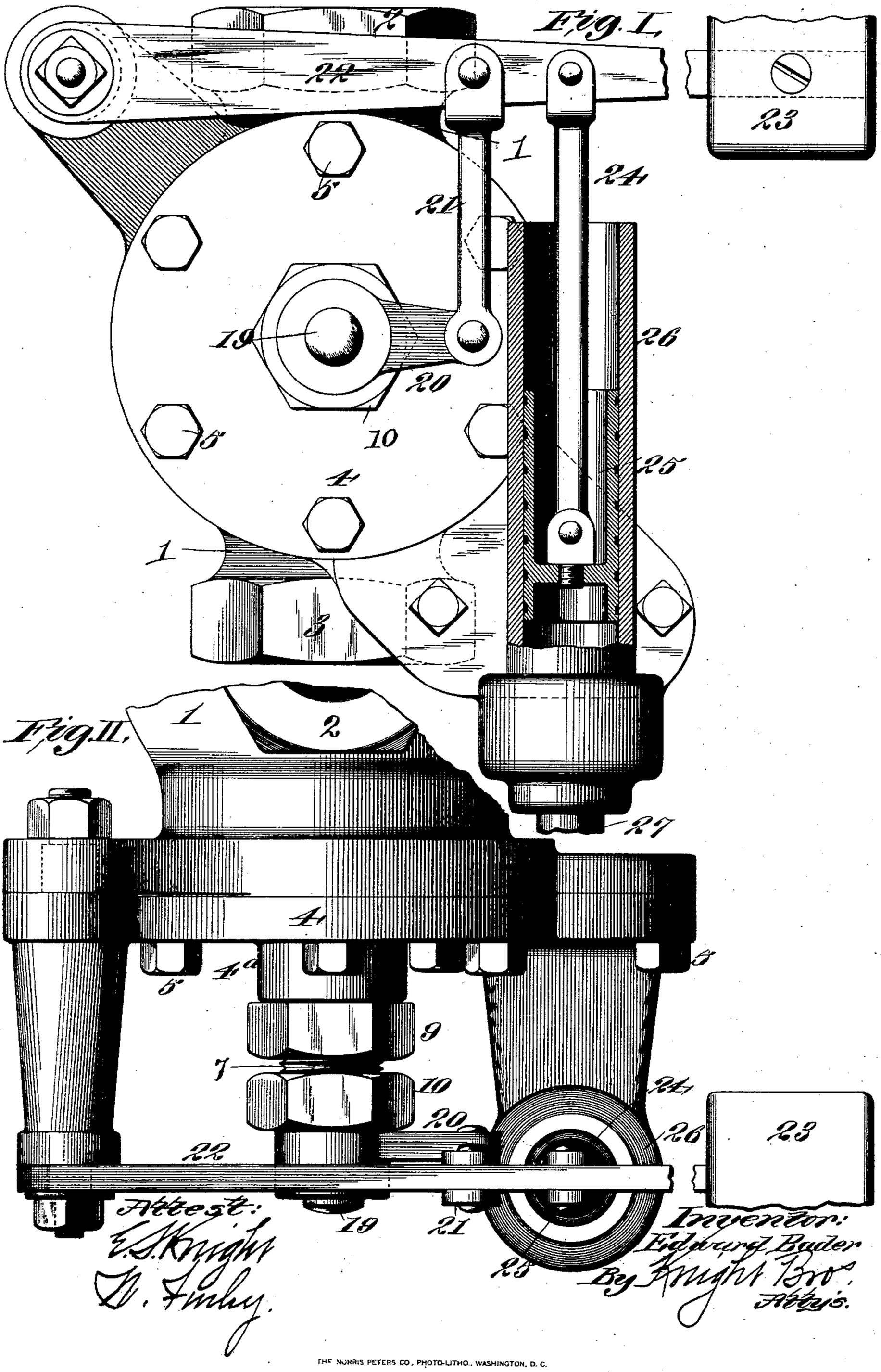

Fig. II.

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Inventor:
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By Knight Bros.
Attys.

(No Model.) 2 Sheets—Sheet 2.

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FLUID PRESSURE REGULATOR.

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Fig. III.

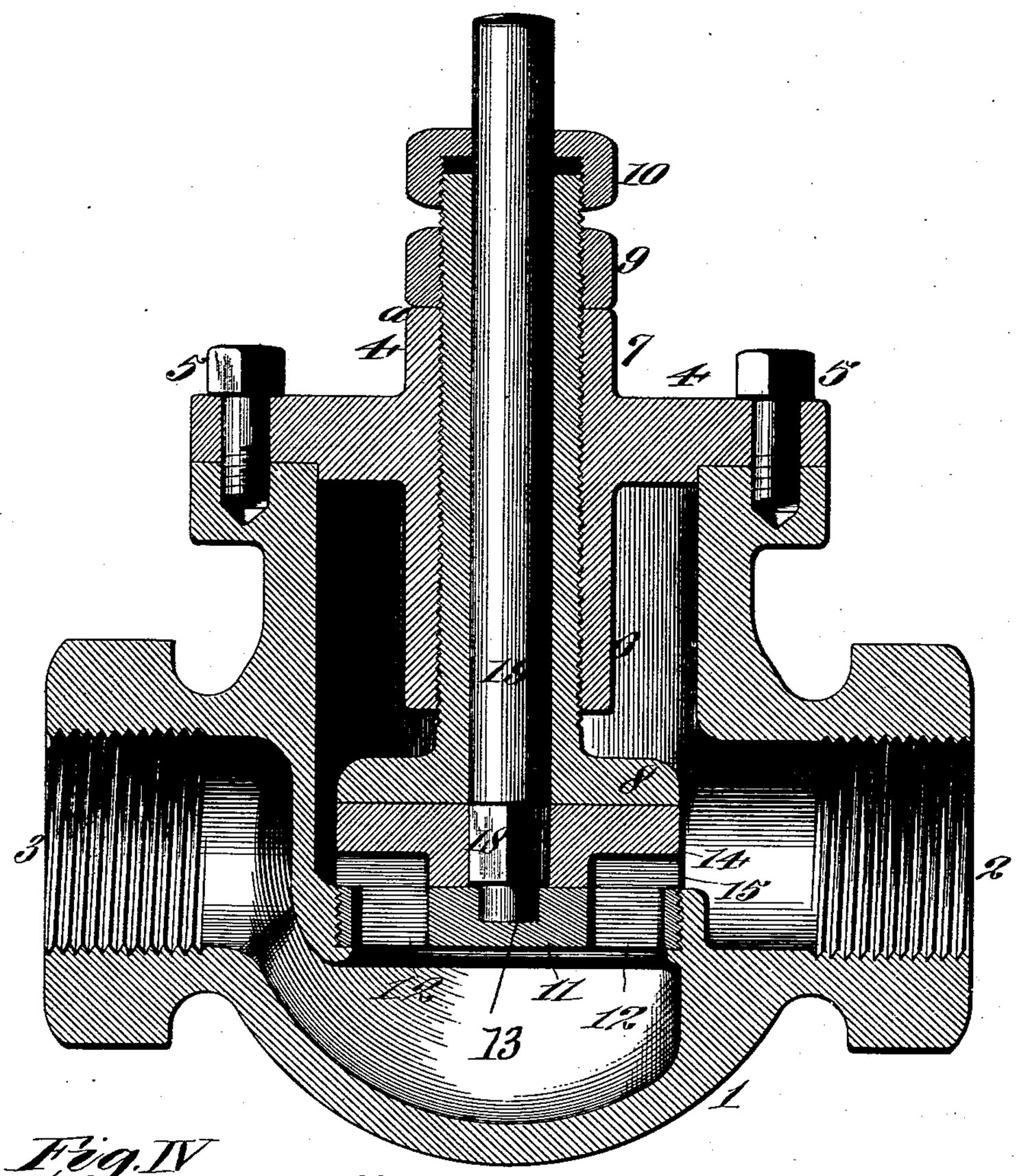

Fig. IV

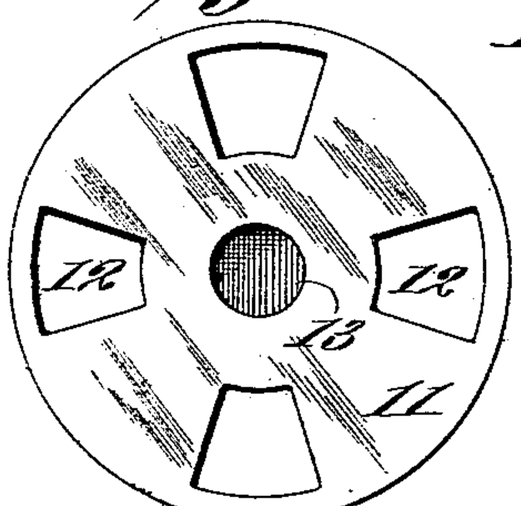

Fig. V.

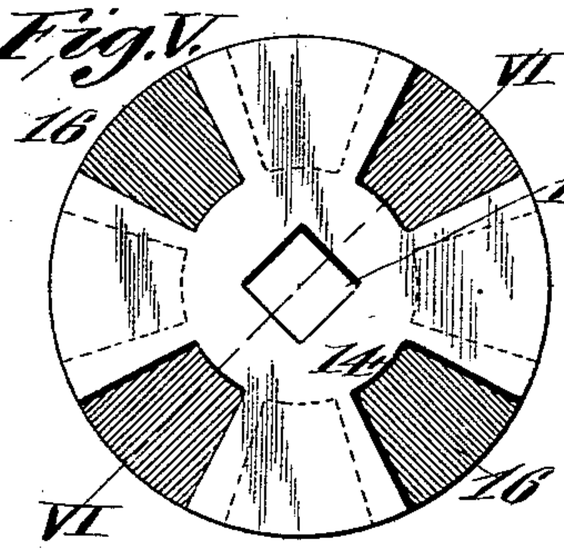

Fig. VI

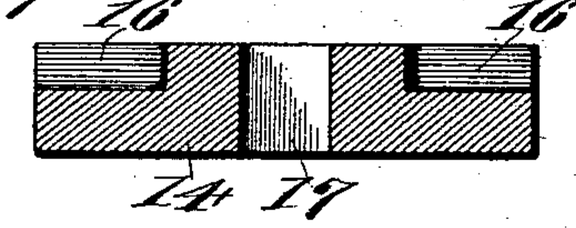

Fig. VII.

Attest:
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H. Finley.

Inventor:
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Attys.

UNITED STATES PATENT OFFICE.

EDWARD BADER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO AUGUST FRIZ, OF SAME PLACE.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 571,913, dated November 24, 1896.

Application filed September 19, 1895. Serial No. 562,968. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BADER, a citizen of the United States, and a resident of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Pressure-Regulators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of regulators or engine-governors employed to control the varied pressures in different parts of a steam, compressed-air, or other system of pipes or to control the speed of engines, the object of my invention being to provide a valve which will operate with slight power and which is so balanced on both the high and low pressure sides that it will easily respond to the least variation in pressure at the low-pressure side falling below the normal predetermined limit; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure I illustrates a side elevation of my improved pressure-regulator, a portion of the auxiliary cylinder and piston being shown in vertical section. Fig. II is a top view of the side of the regulator shown in Fig. I. Fig. III illustrates a vertical section taken through the regulator. Fig. IV is a view of the valve-seat. Fig. V is a view of the valve. Fig. VI is a cross-section taken on line VI VI, Fig. V. Fig. VII is an edge view of the valve.

In the drawings, 1 designates the housing, and 2 the supply or high-pressure side opening, and 3 the delivery or low-pressure side opening.

4 designates a cap secured to the housing by means of screw-bolts 5, and integrally formed with said cap is an inwardly-extending sleeve 6, that is screw-threaded upon its interior and is designed to receive the stem 7 of a plate 8, which stem is screw-threaded to engage the sleeve 6. The outer end of the stem 7 protrudes beyond the outer surface of the cap 4, where it is provided with a nut 9 and a packing-nut 10, the nut 9 bearing against an annular flange 4^a on the cap 4.

11 designates a valve-seat removably set into the housing 1 in the passage between the supply and delivery openings 2 and 3. This valve-seat 11 is provided with ports 12.

14 designates a valve located between the valve-seat 11 and the plate 8 and provided with recesses 15, that are arranged to be turned into registration with the ports 12 to form passage-ways from the supply side of the regulator to the delivery side. The valve 14 also has recesses 16 at the opposite face from that in which the recesses 15 are located, and it is through the medium of these recesses 15 and 16, located at the opposite sides of the valve, that I obtain the result of the quick action of the valve on the variance of pressure at the low-pressure side of the regulator. Owing to the fact that the valve being provided with recesses at each side the steam or other medium at both the high and low pressure sides is exerted upon each face of the valve, and as a consequence the valve is absolutely balanced and thereby caused to move readily on a slight variation from the proper degree of pressure.

The valve 14 is provided with a central square opening 17, that is designed to receive the square portion 18 of a stem 19, whose inner end is seated in the cavity 13 of the valve-seat 11. The outer end of the stem 19 has attached to it a crank-arm 20, that is connected by a link 21 to a pivoted lever 22, provided with an adjustable weight 23. Connected to the lever 22 is a piston-rod 24, that carries a piston 25, operating in an auxiliary cylinder 26. The auxiliary cylinder is open at its upper end, and at its lower end is provided with connection to a pipe 27, that leads to any desired portion of the delivery-pipe at the low-pressure side of the regulator. By the employment of the adjustable plate 8 I am enabled to adjust the fitting of the valve to a nicety and prevent any leakage at the valve, and in the event of the valve being reduced by grinding to smooth its face it is readily adjusted on being replaced.

The operation of my device is as follows: The weight 23 is arranged upon the lever 22 at the proper position to gage the desired pressure of steam or other medium, and when the medium has been turned into the delivery-pipe the valve 14 will be entirely opened owing to the fact that the weight 23 is at its

lowest position, (owing to there being no pressure exerted in the cylinder 26 to sustain it,) and the medium will pass through the valve to the low-pressure side until sufficient pressure has entered the low-pressure side to raise the weight 23 by pressure upon the under side of the piston 25. The elevation of the piston will raise the lever 22 and the link 21, which link in its turn will operate the crank-arm 20 and the valve-stem 19 and close the valve 14, thus wholly or partially shutting off the passage through the regulator, and as the pressure varies on the low-pressure side the valve 14 will be caused to vibrate accordingly.

I claim as my invention—

1. In a pressure-regulator, the combination of a housing, a valve-seat in said housing, a valve provided with recesses in both of its side faces, which are arranged out of transverse line with each other and means for operating said valve, substantially as described.

2. In a pressure-regulator, the combination of a housing, a valve-seat in said housing, a valve provided with recesses in both of its faces, said valve being arranged in contact with said valve-seat, and an adjustable plate arranged in contact with the face of said valve, opposite said valve-seat, substantially as and for the purpose set forth.

3. In a pressure-regulator, the combination of a housing, a valve-seat provided with ports, a valve provided with recesses in both of its faces, and means arranged to operate said valve; said means consisting of a weighted lever, a piston connected to said lever, a cylinder in which said piston is arranged to operate, and connection from said cylinder to the delivery side of the regulator, substantially as described.

EDWARD BADER.

In presence of—
E. H. KNIGHT,
W. FINLEY.