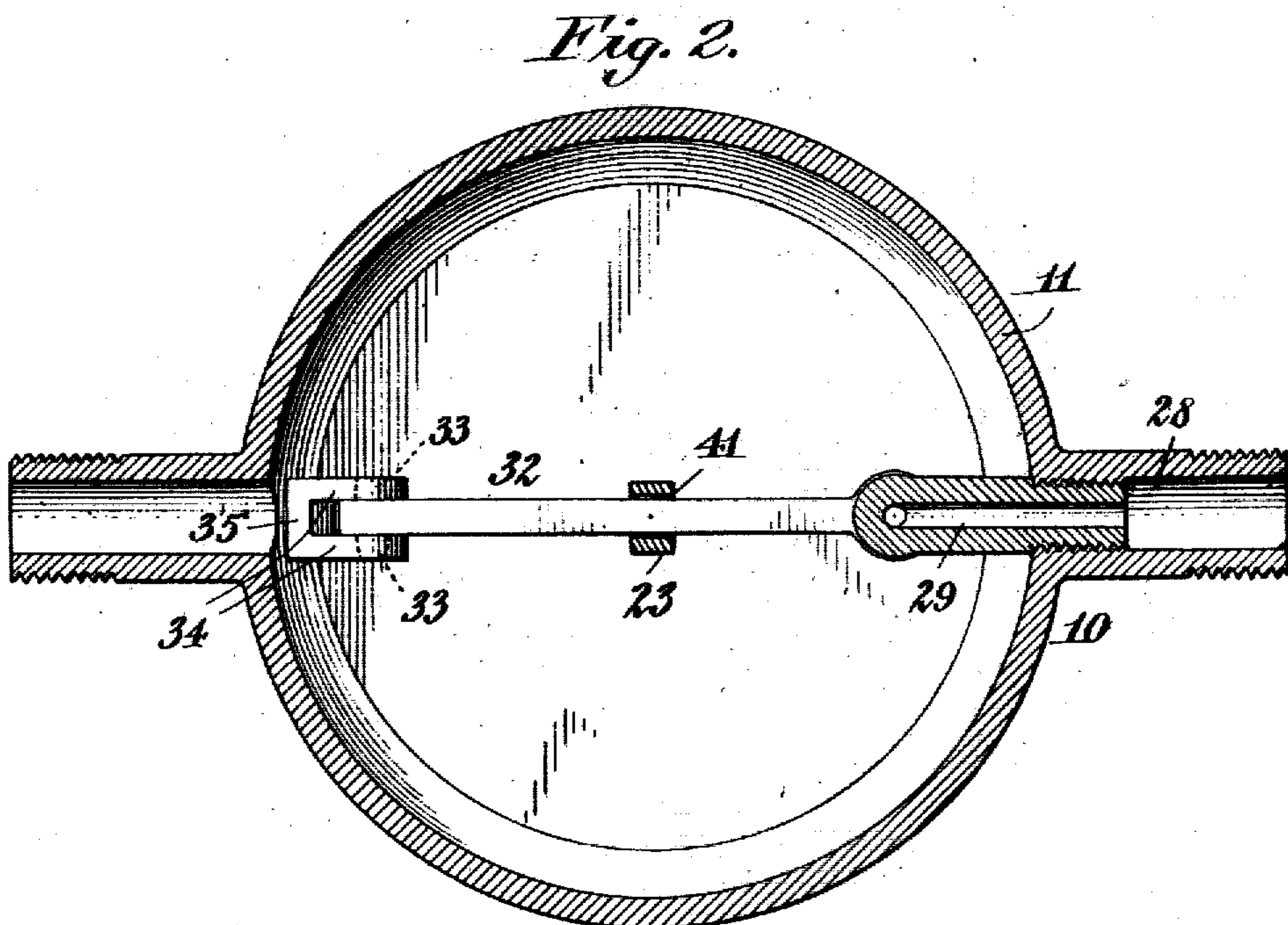
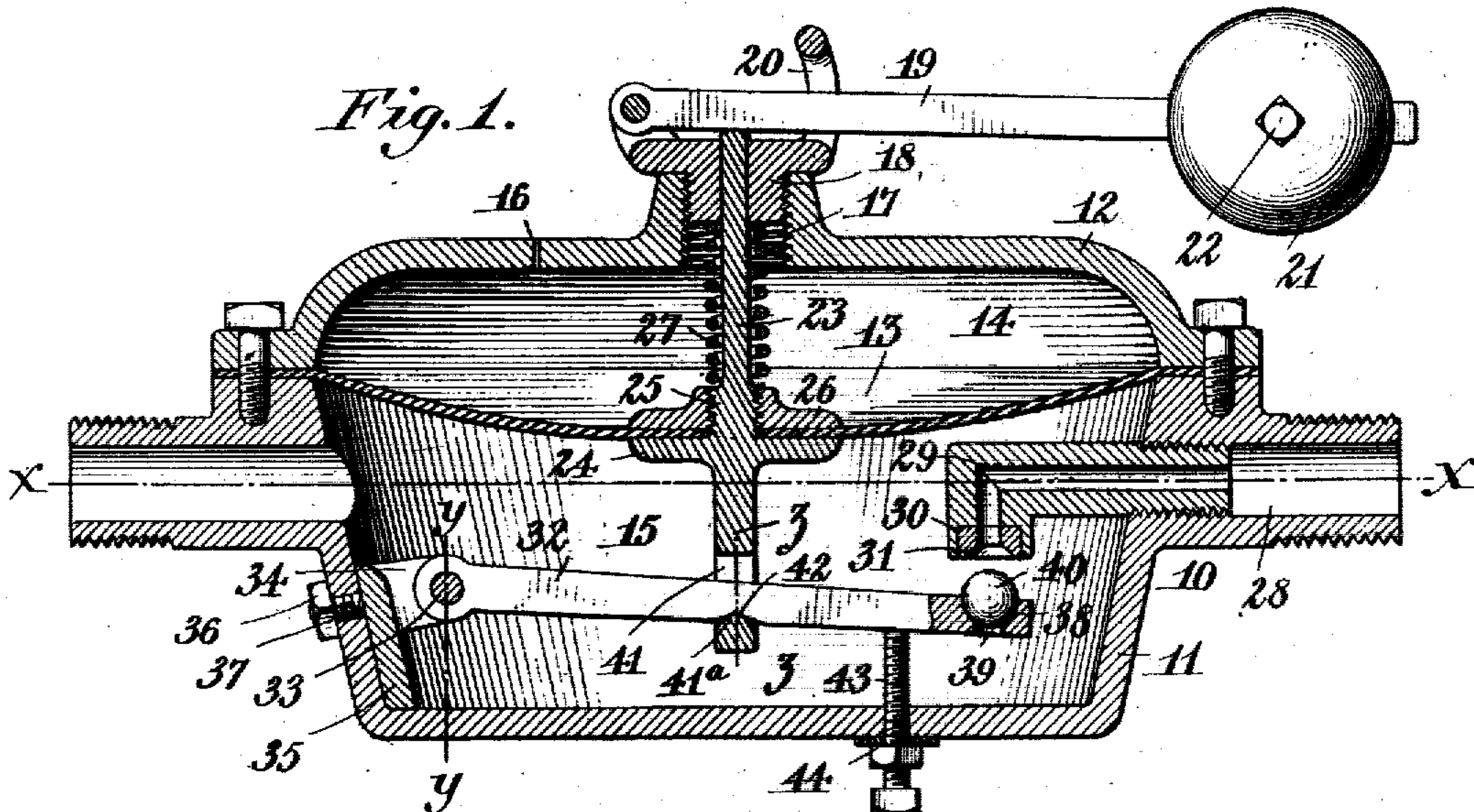


No. 825,559.

PATENTED JULY 10, 1906.

J. R. SCHRADER.
PRESSURE REGULATOR.
APPLICATION FILED JUNE 28, 1905.

2 SHEETS—SHEET 1.



Witnesses:

Julius Lankes
Harry Harris

John R. Schrader, Inventor.

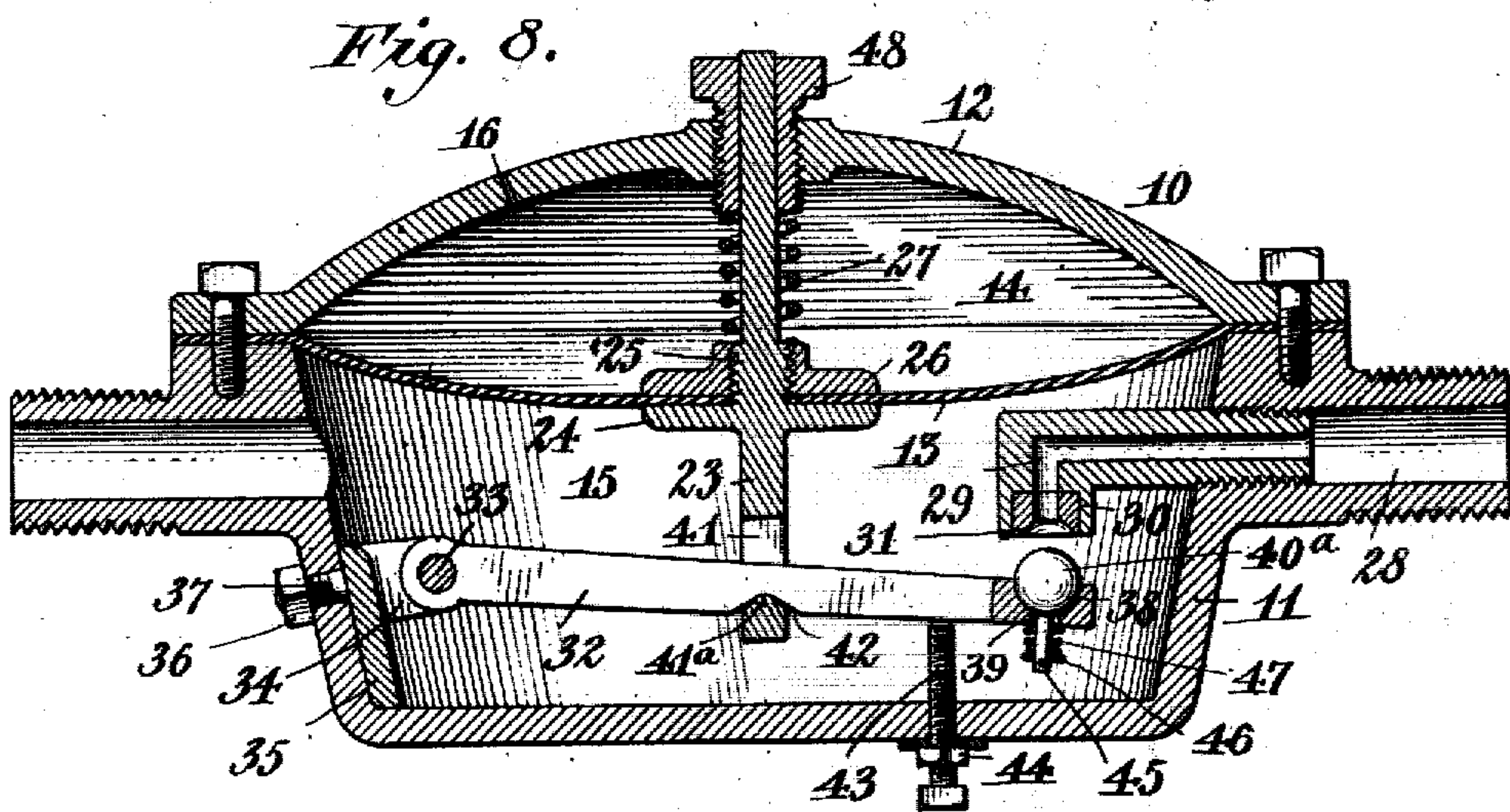
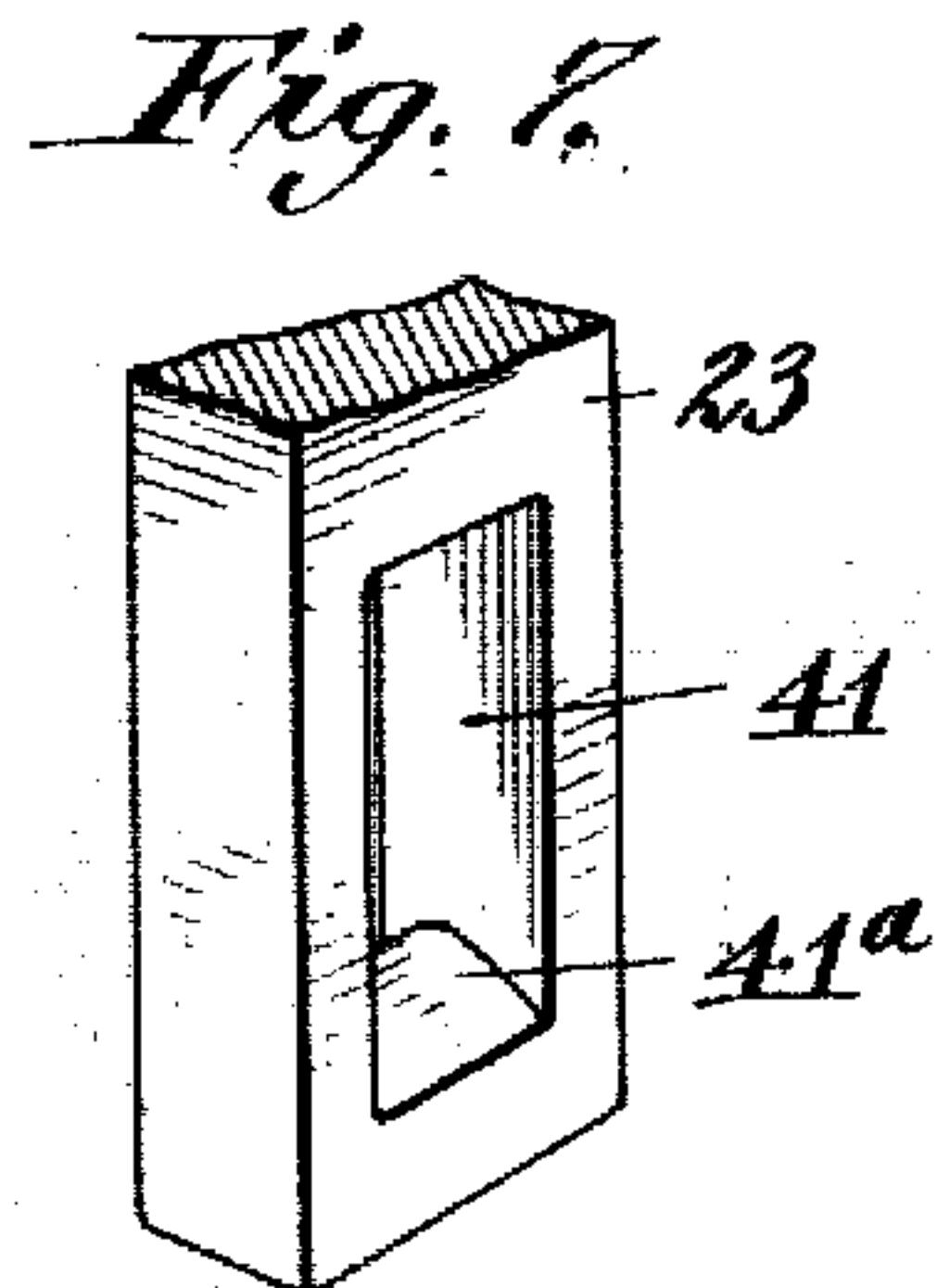
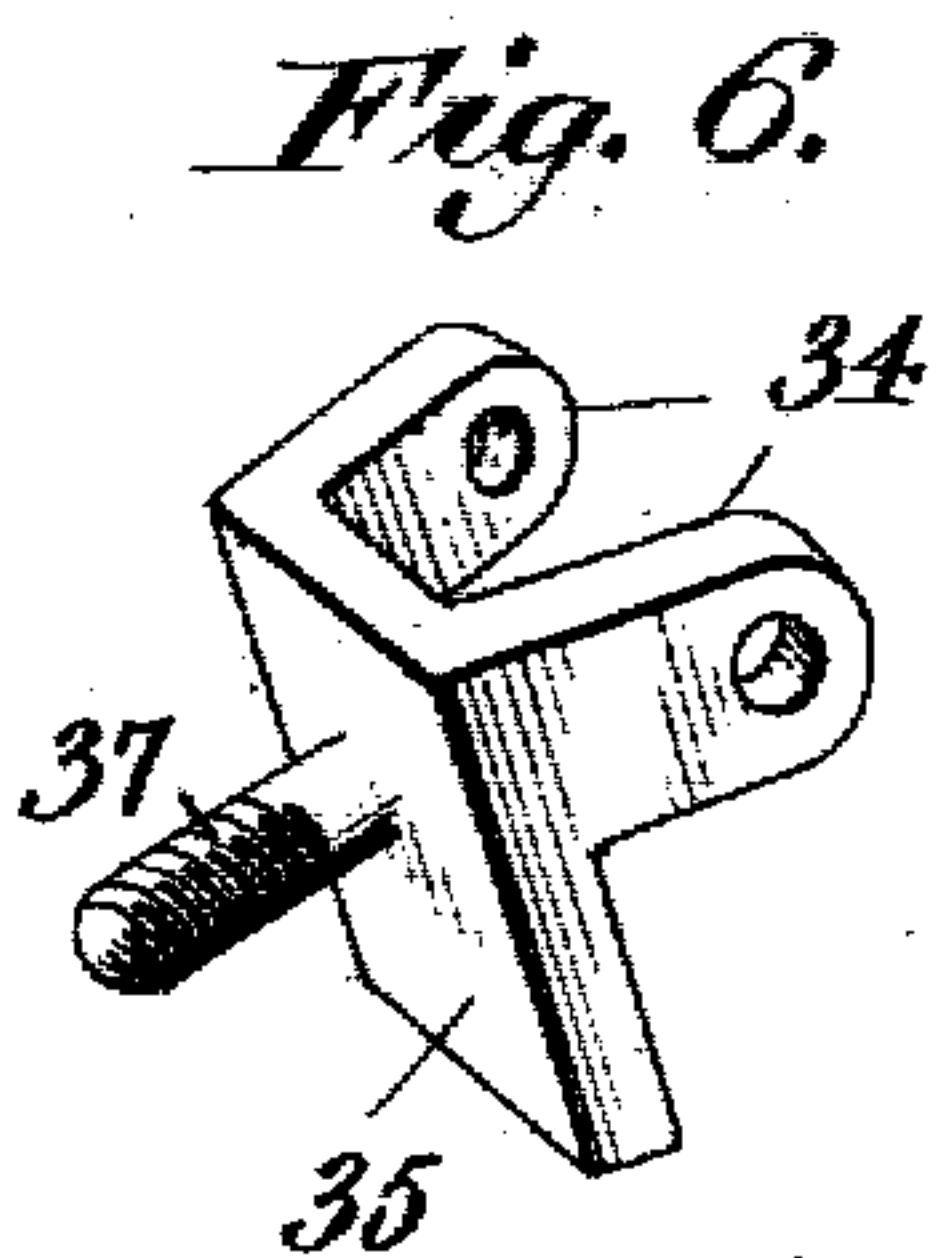
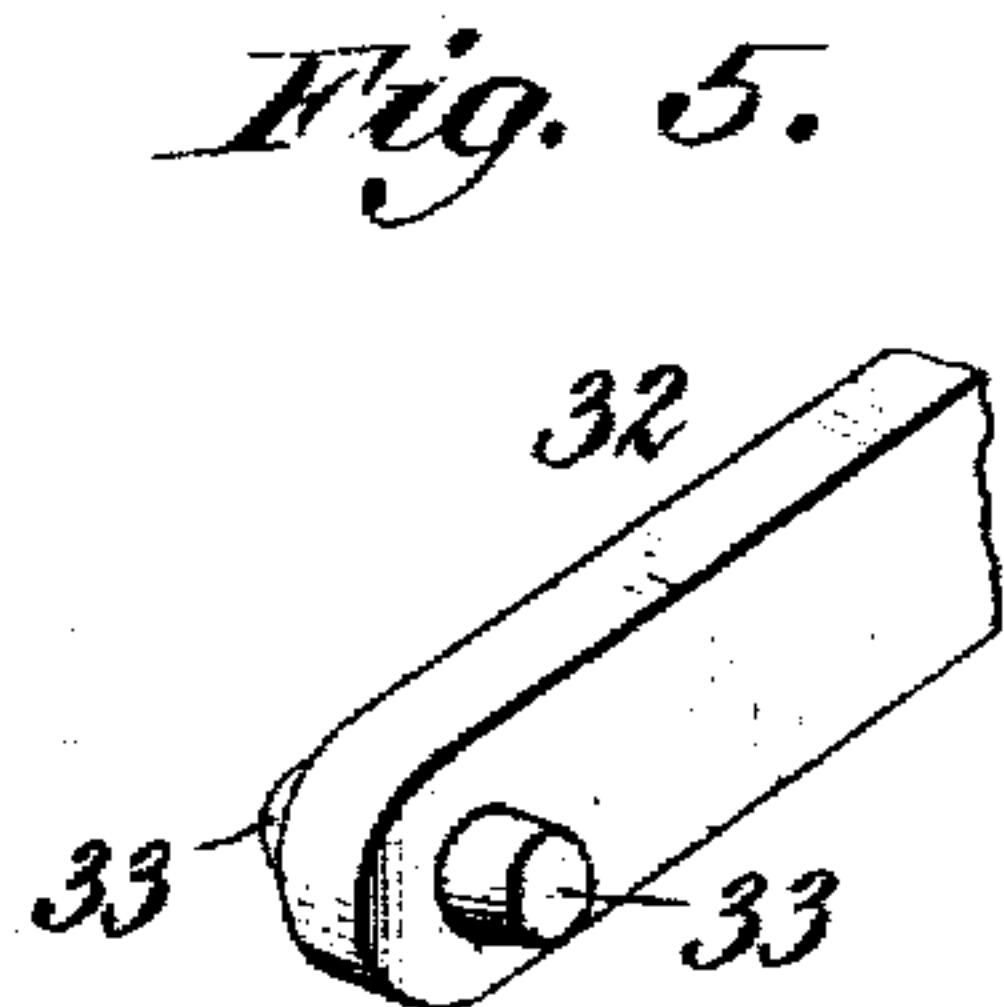
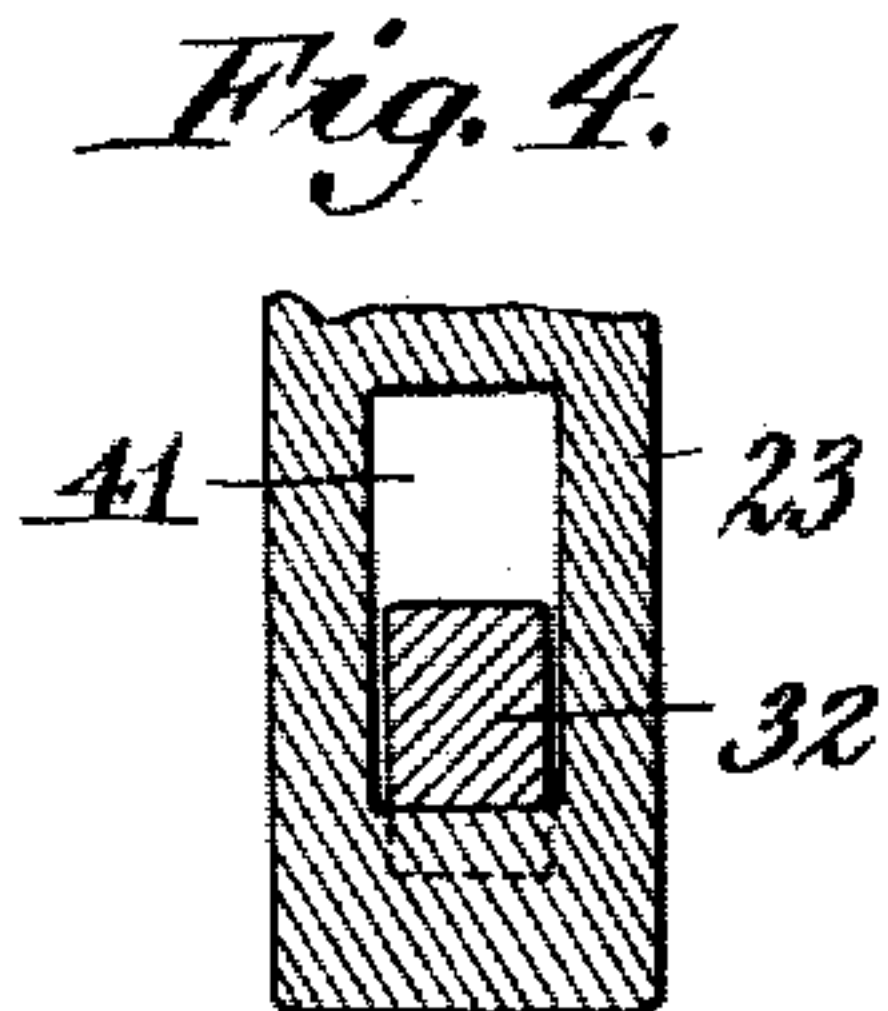
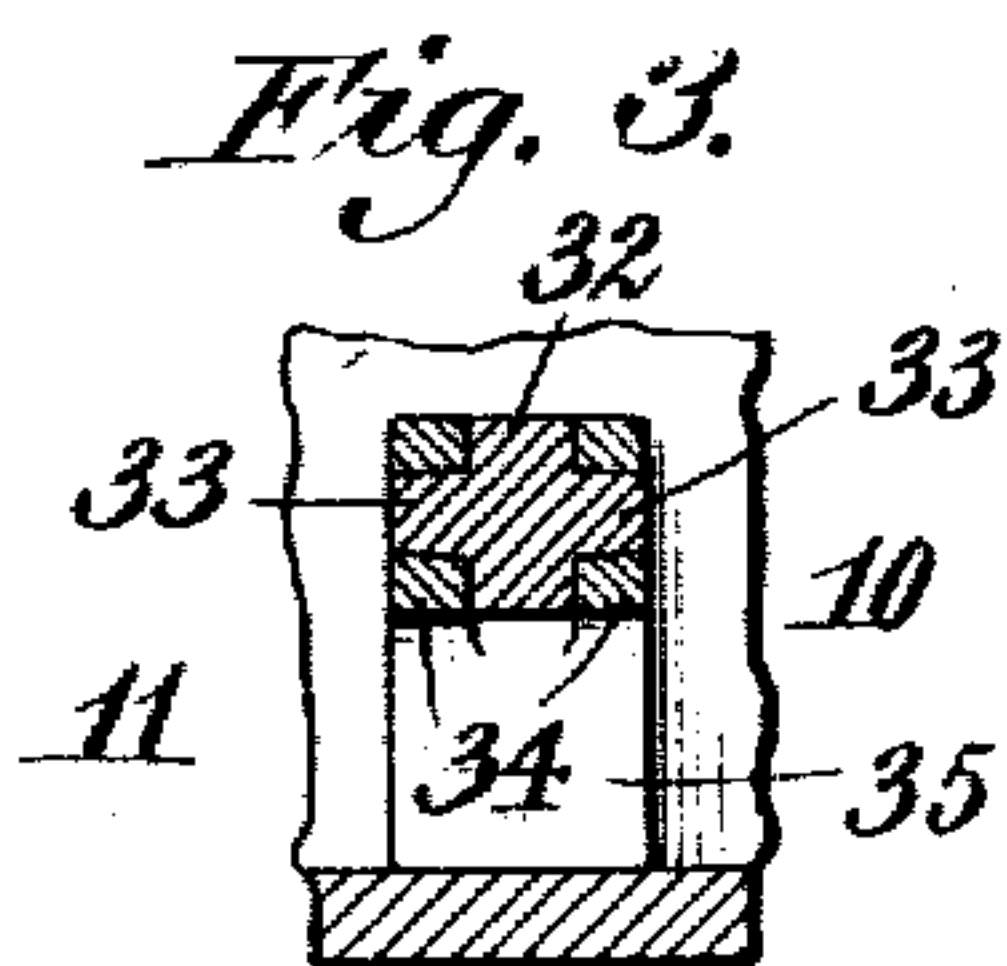
By Emil Neubach Attorney.

No. 825,559.

PATENTED JULY 10, 1906.

J. R. SCHRADER.
PRESSURE REGULATOR.
APPLICATION FILED JUNE 29, 1905.

2 SHEETS—SHEET 2



Witnesses:

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Attorney.

UNITED STATES PATENT OFFICE.

JOHN R. SCHRADER, OF BUFFALO, NEW YORK, ASSIGNOR TO BUFFALO GAS GENERATOR & MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

PRESSURE-REGULATOR.

No. 825,559.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed June 29, 1905. Serial No. 267,641.

To all whom it may concern:

Be it known that I, JOHN R. SCHRADER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification.

My invention relates to pressure-regulators, such as are used for reducing and regulating the pressure of gaseous substances or fluids.

The primary object of my invention is the provision of a simple and highly-effective valve within the regulator-casing which is free within a retaining-pocket and caused to revolve within said pocket by the flow of the gaseous substance or fluid through the inlet of the casing, whereby the valve is freed of adhering matter by the frictional action of the same against the walls of its retaining-pocket.

Other objects are to simplify regulators of this type now in use, to provide means for limiting the extent of opening between the valve and its seat, to provide an improved connection between the movable pressure device and the valve-lever, and to reduce the number of parts to a minimum.

With these and other objects in view my invention consists in the formation, construction, arrangement, and combination of parts to be hereinafter described, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a central vertical section through the regulator, showing the preferred construction of my invention. Fig. 2 is a horizontal section taken on line *x x*, Fig. 1. Fig. 3 is a vertical section taken on line *y y*, Fig. 1. Fig. 4 is an enlarged vertical section taken on line *z z*, Fig. 1. Fig. 5 is an enlarged perspective view of the pivoted end of the valve-lever. Fig. 6 is an enlarged detached perspective view of the bracket or casting to which the valve-lever is pivotally secured. Fig. 7 is an enlarged perspective view of the lower end of the diaphragm-rod. Fig. 8 is a central vertical section of a regulator, showing my invention in modified form.

Referring to the drawings in detail, like numerals of reference refer to like parts in the several figures.

The reference-numeral 10 designates the casing, which may be of any form or con-

struction capable of use for the purpose of this invention. I prefer, however, that the same may be made in two parts 11 12, which I respectively term the "body" and the "cover." A flexible diaphragm 13, such as is commonly used in regulators of this kind, is interposed between the body 11 and cover 12 and divides the casing into an air-space 14 and a fluid or gas space 15. As is well known, the air-space is provided with a vent 16, herein shown in the upper wall of the cover.

Arranged centrally in the cover is a threaded opening 17, into which is threaded a bushing 18, having pivoted thereon a lever 19, guided in its movements in a slotted lug 20, formed on said bushing. Said lever is fitted with a weight 21, adjustable thereon and provided with a set-screw 22, by means of which it is held in any adjusted position.

Movable with the flexible diaphragm is a vertically-disposed rod 23, that passes centrally through said diaphragm and is guided for movement in the bushing 18. Said rod is provided with a circumferential flange 24 and with a threaded portion 25 adjacent said flange, and onto said threaded portion is screwed a clamping-nut 26, between which and the flange 24 the diaphragm 13 is clamped. A spiral spring 27 surrounds said rod between the bushing 18 and the nut 26 and tends to hold the diaphragm in its lowered position. The upper end of the rod 23 projects through the bushing, and the weighted lever 19 exerts its power thereagainst to hold said diaphragm in its lowered position. Said weighted lever, diaphragm, diaphragm-rod, and spring constitute the movable pressure device.

The body of the regulator-casing is provided with an inlet 28, having an elbow-conduit 29, opening downwardly into the casing. The inner end of said conduit is counterbored, as at 30, and a soft-metal valve-seat 31 cast in said counterbore, said valve-seat being concave to conform to the outline of a spherical valve to be presently described.

A lever 32 is provided at one end with opposite pivot-trunnions 33, that enter pivot-holes in a pair of lugs 34, formed on a plate 35, which is secured to the casing by a nut 36, threaded onto a screw-stud 37, formed on said plate and extending through an opening in the casing. To prevent turning of said

plate on the screw-stud, the lower end thereof bears against the bottom of the casing, as shown in Fig. 3.

The plate and lugs constitute a casting 5 which is preferably of malleable iron, and the lugs thereof are cast in diverging relation, as shown in Fig. 6, to permit the insertion of the lever therebetween, after which they are closed upon the lever to cause the trunnions 10 of the latter to enter the pivot-holes in the lugs 34. In this manner a separate pivot-pin and the drilling of a hole through the lever is dispensed with.

The free end of the lever is located directly 15 beneath the valve-seat 31 and provided with a semispherical pocket 38 and an opening 39, extending from said pocket through the lever. A spherical valve 40 is loosely held in said pocket and is revolved when unseated by the 20 pressure of the fluid as it issues from the inlet. In this manner the valve is freed from all adhering substances, and a perfect closure of the inlet is assured. The opening 39, leading from the pocket 38, serves to discharge 25 grit and other matter to the bottom of the casing.

The valve-lever 32 passes through a slot 41 in the diaphragm-rod 23 and is provided with a V-shaped notch 42 in its under side, into 30 which fits an oppositely-inclined ridge 41^a, whose inclination is greater than the inclined walls of said notch, thus serving as a fulcrum-point for the valve-lever and by reason of the difference in the inclination or angle of the 35 notch and the ridge affords the clearance necessary to a free action of the lever. In this manner the drilling of pivot-holes and the use of a pivot-pin are dispensed with, resulting in a construction which can be easily 40 assembled and as readily disassembled.

The distance between the inner end of the inlet-conduit and the free end of the valve-lever when it is in its lowermost position should be less than the diameter of the valve, so that 45 the valve cannot become dislodged from its retaining-pocket. For this purpose I provide a set-screw 43, which is passed through the bottom of the casing and is adjustable to limit the downward movement of the valve-lever, a clamping-nut 44 being employed to 50 retain the set-screw in any adjusted position.

In Fig. 8 I have shown the ball-valve 40^a provided with a stem 45, that extends through

the opening 39 in the valve-lever. Surrounding the protruding end of said stem between 55 the valve-lever and a collar 46 on said stem is a spiral spring 47. This construction permits the ball to move freely within certain limits, while holding the same securely to said lever. The weighted lever 19 may be 60 dispensed with, and in lieu thereof an adjustable bushing 48 provided, by means of which the spring 27 can be placed under more or less tension.

Having thus described my invention, what 65 I claim is—

1. In a pressure-regulator, the combination with a casing having an outlet and an inlet provided with a valve-seat, a movable pressure device, a lever having opposite trunnions at one end and held in operative connection with said pressure device, a casting 70 bearing against the bottom of the casing and having two apertured lugs for the reception of the trunnions on said lever and having 75 also a screw-stud passing through the side wall of the casing, a nut screwed onto the protruding end of said stud, and a valve carried by said lever and serving to open and close 80 said inlet.

2. In a pressure-regulator, the combination with a casing having an outlet and an inlet elbow-conduit provided with a concaved valve-seat, a movable pressure device, a pivoted lever operatively connected with said 85 pressure device and having a concaved pocket and an opening extending from said pocket through said lever, and a spherical valve located in said pocket substantially as and for the purpose described. 90

3. In a pressure-regulator, the combination with a casing having an inlet and an outlet, a movable pressure device within said casing, a lever pivoted at one end and having operative connection with said pressure device, 95 a valve at the free end of said lever, and a set-screw extending through the bottom of the casing with its free end in the path of said lever to limit the movement thereof.

In testimony whereof I have affixed my 100 signature in the presence of two subscribing witnesses.

JOHN R. SCHRADER.

Witnesses:

EMIL NECHART,

HARTE M. PALMER.