

L. P. LOWE.  
FLUID PRESSURE REGULATOR.  
APPLICATION FILED MAY 3, 1909.

967,214.

Patented Aug. 16, 1910.

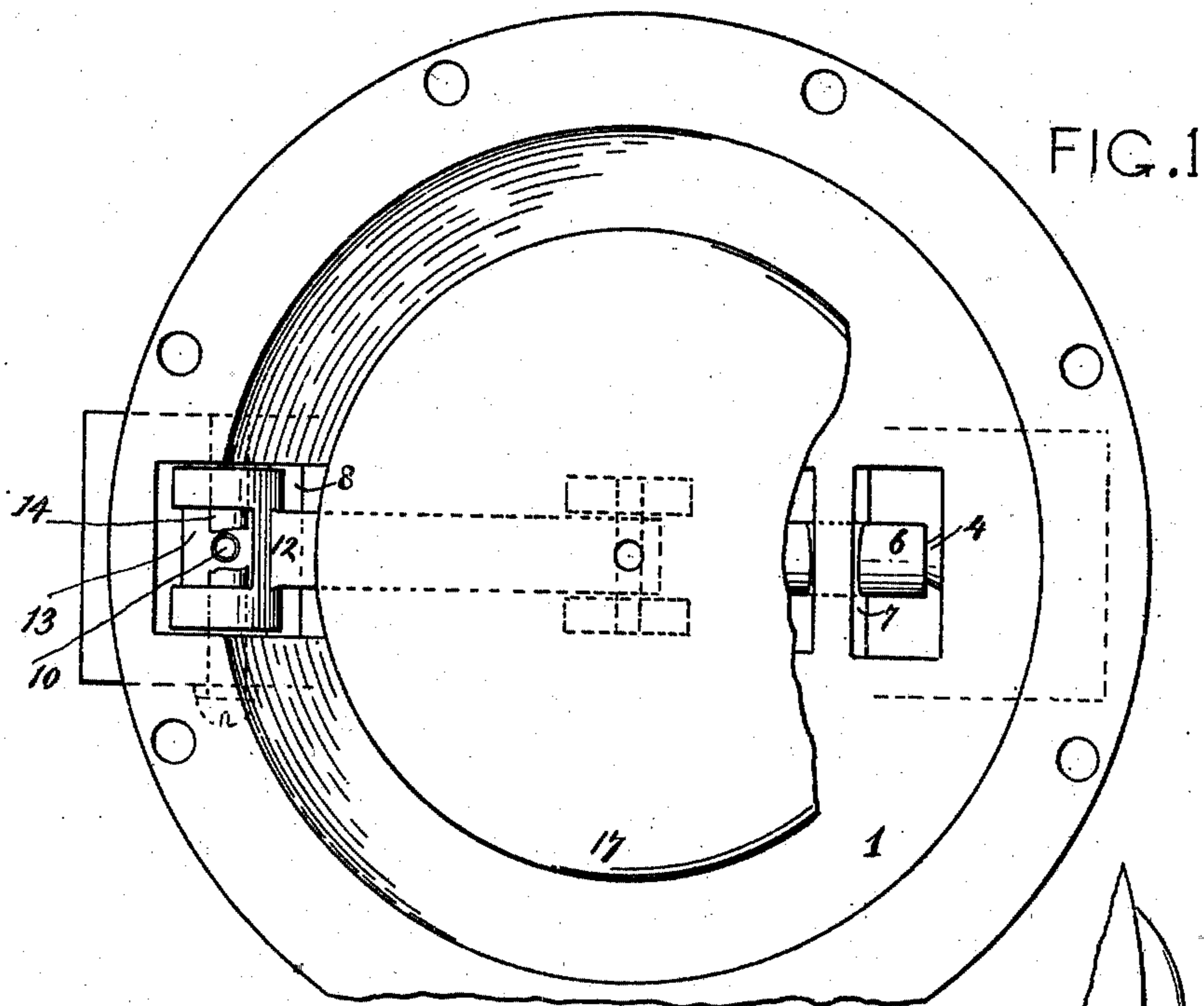


FIG. 1

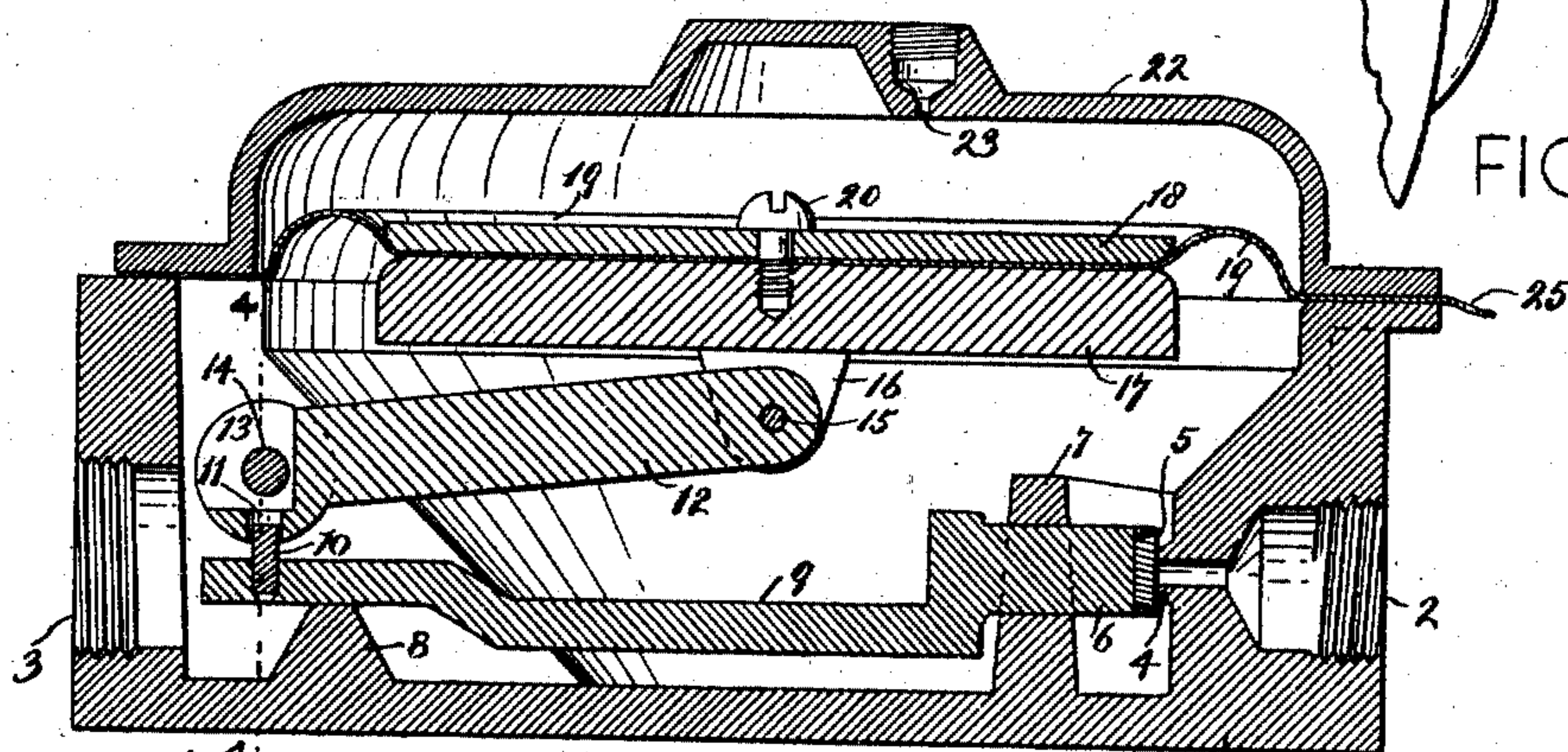


FIG. 2

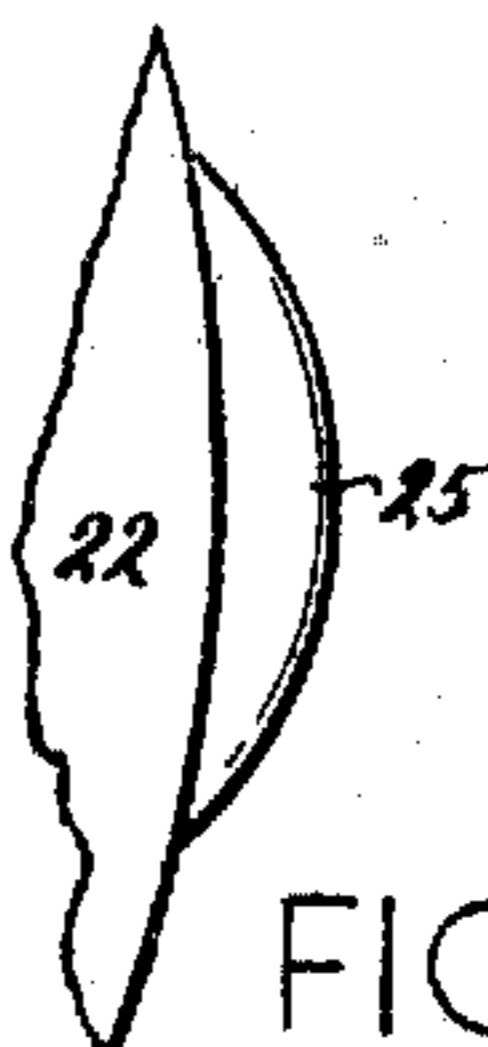


FIG. 3

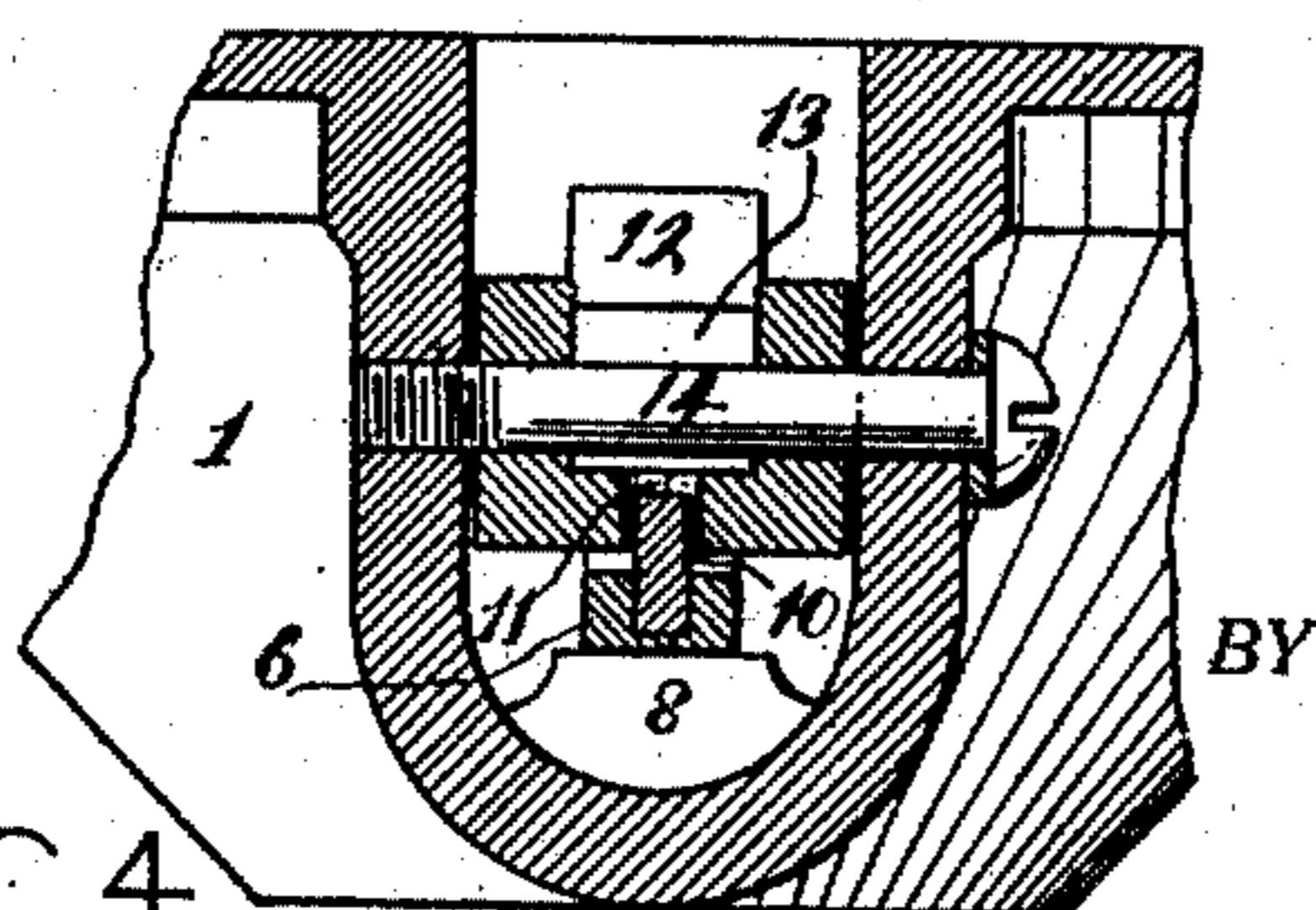


FIG. 4

WITNESSES:  
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# UNITED STATES PATENT OFFICE.

LEON P. LOWE, OF SAN FRANCISCO, CALIFORNIA.

## FLUID-PRESSURE REGULATOR.

967,214.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed May 3, 1909. Serial No. 493,536.

*To all whom it may concern:*

Be it known that I, LEON P. LOWE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Fluid-Pressure Regulators, of which the following is a specification.

The present invention relates to improvements in fluid pressure regulators, the object of the invention being to provide a regulator of this character which shall be compact in form, simple in construction, and easily assembled, which will automatically close the passage of the fluid, when desired, even against a very high pressure thereof, and with which the diaphragm can readily be removed uninjured.

In the accompanying drawings, Figure 1 is a plan view of the body portion of the regulator, the cover being removed showing also, in broken plan view, the lower diaphragm disk; Fig. 2 is a diametrical section thereof; Fig. 3 is a broken plan view of the edge of the regulator; Fig. 4 is a broken cross-section of the main body of the regulator on the line 4-4 of Fig. 2, looking in the direction of the arrow.

Referring to the drawing, 1 indicates the body of the regulator having diametrically opposite threaded holes 2, 3, for inlet and discharge pipes respectively. The hole 2 terminates at its inner end in a valve seat 4, which is closed by a disk 5 of leather or other yielding material forming a valve and carried in a recess in the end of a valve stem 6. At its end near said aperture slides said stem, through a guide 7 formed on said body 1, and at its end remote therefrom it slides over a ledge 8. In the center it is bent down, as shown at 9. At the end remote from the valve, said stem carries an upwardly extending pin 10 which enters an aperture 11 in a lever 12. At the end adjacent to said aperture 11 said lever 12 is recessed on its upper side as shown at 13, and a screw 14, passed loosely through one side of the wall of the body of the regulator and screwed into the other side thereof, passes through the sides of said recessed portion of the lever and serves as a pivot pin for said lever. The other end of said lever is pivotally connected by a pin 15 with lugs 16 depending from a diaphragm disk 17. Between said disk 17 and an upper disk 18 is interposed a

flexible diaphragm 19, said disks, 17, 18, being secured together by a central screw 20. The edge of said diaphragm 19 is clamped between the body 1 of the regulator and a cover 22, which has a vent hole 23. At one part of its periphery the diaphragm extends beyond the edge of the body portion, as shown at 25.

The following are the advantages of my improved fluid pressure regulator.

First, since the stem 6 is bent down, in the center the outer end of the long arm of the lever 11, and therefore also the regulator disk 17, can descend lower than would otherwise be possible, and therefore the regulator can be made low and compact.

Second, when the valve 5 closes the inlet opening for the gas, it is pressed against said opening by the short arm of the lever pressing against the pin 10. The point at which said pressure takes place is at the bottom of the aperture for the pin, and the distance of this point from the pivotal center of the lever is very small compared with the length of the long arm of the lever. The pressure of the valve on its seat, due to the upward pressure upon the diaphragm by the fluid pressure within the regulator, is increased in a corresponding ratio. Moreover, this pressure is applied in a direction exactly at right angles to the plane of the valve seat and therefore acts to the best advantage to close said valve. Hence the pressure of the valve on its seat can be so great that it withstands the passage of fluid even under great pressure in the inlet pipe.

Third, while the front end of the valve stem 6 slides through the guide 7, such a guide is not necessary for its rear end, which may merely rest upon the ledge 8, for said rear end is prevented having any lateral motion by reason of the pin 9 engaging the aperture 10 in the lever. It will also be observed that the slideway 7 for the stem of the valve, and the rear end of the stem, are in a direct line in front of the outlet opening 3 of the regulator. The parts are therefore very easily assembled. Having first removed the pivot screw 13 it is only necessary to insert the valve stem through the slide 7, and slide the rear end of the stem upon the ledge 8 until the pin 9 in the rear end of the stem arrives immediately beneath the aperture 11 in the lever 12, then to drop the rear end of said lever so that said pin enters said aperture, and then to pass the pivot

screw 13 through the pivot holes in the end of the lever 11. Thus the parts are easily assembled.

Fourth, in removing diaphragms to examine or repair fluid pressure regulators, it is generally necessary to insert a knife between the edge of a diaphragm and the edge of the body of the regulator. In doing so it frequently happens that the diaphragm is cut or injured. By extending the diaphragm, as shown at 25, the above possibility is avoided, as, after removing the cover, the projecting lip of the diaphragm can be easily taken hold of, and the diaphragm thereby lifted from its seat.

I claim:—

1. A fluid pressure regulator comprising a body having an inlet opening, a cover, a diaphragm interposed between said body and cover, a disk secured to said diaphragm, a lever fulcrumed in said body, its long arm being pivotally attached to said disk, and a valve for closing said opening, having a stem depressed beneath said lever, said stem being actuated by said lever to open or close said valve, substantially as described.

2. In a fluid pressure regulator, the combination of a regulator body, having an inlet opening, a valve for closing said opening, a stem for actuating said valve, a diaphragm, a lever pivotally connected to said diaphragm and having an aperture, and a pin extending upward from said stem, and

entering said aperture, substantially as described.

3. In a fluid pressure regulator, the combination of a regulator body, having an inlet opening, a valve for closing said opening, a stem for said valve, a guide near the valve seat through which said stem slides, a ledge remote from the valve seat upon which said stem moves, a diaphragm, and a lever pivotally attached at one end to said diaphragm, and at the other end operatively connected with said stem, substantially as described.

4. In a fluid pressure regulator, the combination of a regulator body, having an inlet opening, a valve for closing said opening, a stem for said valve, a guide near the valve seat through which said stem slides, a ledge remote from the valve seat upon which said stem moves, a diaphragm, and a lever pivotally attached at one end to said diaphragm and at the other end operatively connected with said stem, the body having an outlet opening in line with said operative connection and the valve seat, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEON P. LOWE.

Witnesses:

F. M. WRIGHT,  
D. B. RICHARDS.