

W. LEUCKERT.
PRESSURE REGULATOR.
APPLICATION FILED NOV. 30, 1909.

963,376.

Patented July 5, 1910.

Fig. 1.

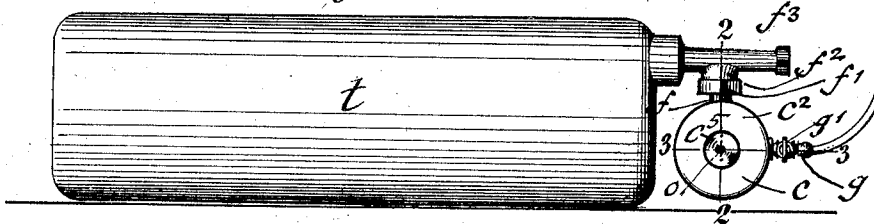


Fig. 3.

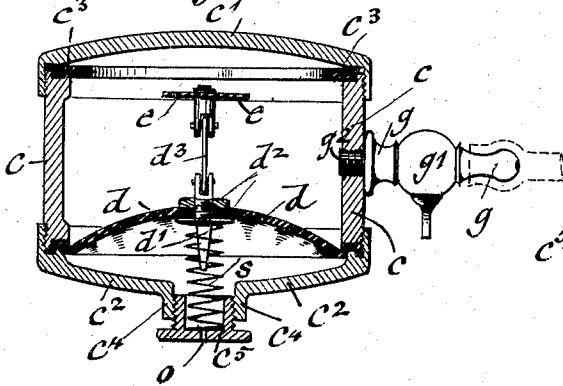


Fig. 2.

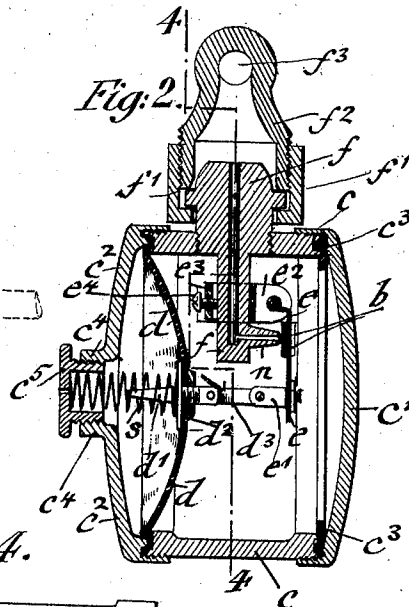
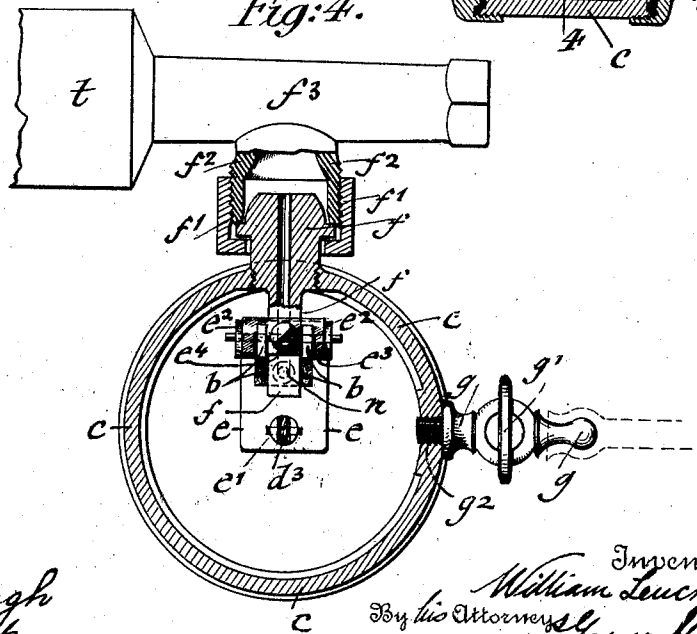


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PRESSURE-REGULATOR.

963,376.

Specification of Letters Patent.

Patented July 5, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM LEUCKERT, a citizen of the United States of America, residing in New York, in the borough of
5 Manhattan, county and State of New York, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification.

This invention relates to an improved
10 pressure-regulator for tanks containing acetylene or other gas under pressure used on automobiles and other vehicles, so that a uniform supply of gas can be supplied to the burners of automobile or other lamps,
15 whatever be the pressure of the gas in the tank; and the invention consists of a pressure-regulator comprising a cylindrical casing, a supply-nozzle for the acetylene or other gas in said casing, a pendent plate
20 provided with an elastic block for opening or closing said nozzle, an elastic diaphragm in said casing, means for connecting the pendent plate with said diaphragm, and a
25 valved discharge-nipple for said casing for delivering the gas at uniform pressure to the lamps.

The invention consists further of certain details of construction which will be fully described hereinafter and finally pointed
30 out in the claims.

In the accompanying drawing, Figure 1 represents a side-elevation, showing a tank containing acetylene or other gas under pressure with my improved pressure-regu-
35 lator connected therewith, Fig. 2 is a vertical section on line 2, 2, Fig. 4, Fig. 3 is a horizontal section on line 3, 3, Fig. 1, and Fig. 4 is a vertical transverse section on line 4, 4, Fig. 2.

40 Similar letters of reference indicate corresponding parts throughout the several views.

Referring to the drawing, *c* represents the cylindrical casing of my improved pressure-
45 regulator, which casing is provided with detachable heads *c*¹, *c*² that are screwed by their internally-threaded circumferential flanges on the casing. A rubber gasket *c*³ is interposed between the casing *c* and head
50 *c*¹, while a diaphragm *d*, of convexo-concave shape and of rubber or other elastic material, is interposed between the casing *c* and the opposite head *c*². The head *c*² is provided with a central nipple *c*⁴ into which is
55 screwed a rimmed hollow screw-plug *c*⁵,

which has a small arc-orifice *o* so as to establish atmospheric pressure in the space between the diaphragm *d* and the head *c*². Between the elastic diaphragm *d* and the screw-plug *c*⁵ is interposed a helical spring *s*,
60 the tension of which is regulated by turning the screw-plug *c*⁵ in inward or outward direction, according to the pressure at which the acetylene or other gas is to be delivered to the automobile or other lamps. The
65 spring *s* is held in position at one end by the plug *c*⁵ and at the other end by means of a pin *d*¹ which is attached to the center of the elastic diaphragm *d* and which extends
70 into the helical spring *s*, but without touching the spring *s*, as shown clearly in Figs. 2 and 3. The pin *d*¹ is attached by washers
75 *d*², which are screwed on the shank of the pin, to the center of the diaphragm *d*, the inner end of the pin *d*¹ being connected by
80 pivot-links *d*³ with lugs *e*¹ on the lower end of a pendent plate *e* which is hinged at its upper end to ears *e*² on a cross-bar *e*³ that can be
85 adjusted higher or lower by means of a set-screw *e*⁴ on a supply-pipe *f* which is screwed
in the upper part of the casing *c*. The pipe *f* is connected by an interiorly-threaded coupling-sleeve *f*¹ with an exteriorly-threaded
nipple *f*² on the outlet-pipe *f*³ of a tank *t*,
85 which contains acetylene or other gas under pressure. The lower end of the supply-pipe *f* is provided with a bored-out laterally-extending nozzle *n*² through which the gas
escapes into the casing *c*.

The orifice of the nozzle *n* is closed by a
90 block *b* of soft rubber or other elastic material which is applied by its ends to slots in the pendent plate *e*, the ends of said block being passed through said slots so as to be
95 firmly held in position and conveniently removed and replaced from time to time. By adjusting the pendent plate *e* up or down on the supply-pipe *f* different points of the rubber block *b* may be brought to bear on
100 the nozzle *n*, thus prolonging the life of said block by distributing the wear thereon. The pendent plate *e* is preferably made of some light metal, such as aluminum, so as to move easily under the pressure of the gas escap-
105 ing through the orifice of the nozzle *n*. The casing *c* is provided with a discharge-pipe *g* having a stopcock *g*¹ and a threaded shank *g*², which is screwed into a threaded hole of the casing *c*, as shown in Fig. 3. The dis-
charge-pipe *g* is connected by a flexible pipe
110

and branch-pipes with the different lamps of the automobile or other vehicles.

My improved pressure-regulator for tanks containing acetylene or other gas under pressure is operated as follows: When the communication between the tank and the pressure-regulator is established, the gas escapes through the nozzle *n* into the casing and moves the pendent plate away from the discharge-orifice of the nozzle so as to fill the interior space of the casing with acetylene or other gas at a reduced pressure. The pendent plate moves under the pressure of the gas as far as permitted by the elastic diaphragm until the required pressure is established in the casing, to which the diaphragm is adjusted. An increase of pressure on the diaphragm will produce the contact of the elastic block with the orifice of the nozzle so as to interrupt the further supply of gas to the casing. As soon as the pressure of the gas in the casing is diminished by its supply to the lamps, the elastic diaphragm, under the influence of the spring, moves the block of the pendent plate clear of the discharge-orifice of the nozzle, so that another supply of gas under pressure is delivered to the casing *c*. The opening and closing of the nozzle by the play of the diaphragm and the vibrating motion of the pendent plate produces the alternating admission and interruption of the gas-supply from the tank to the casing, and keeps up thereby the uniform supply of gas to the burners of the lamps at the pressure required. The pressure-regulator supplies gas of uniform pressure to the burners independently of the pressure of the gas in the supply-tank *t*, so that a uniform emission of light from the lamps is kept up.

In addition to the adjustment by the diaphragm in the pressure-regulator, the stopcock can be slightly adjusted, which is of special advantage when a tank with a new supply of compressed acetylene gas is received. Then the initial pressure of the gas conducted to the lamps is somewhat reduced by turning the stopcock so as to diminish the pressure on the burners of the lamps. When the original pressure of the gas in the tank is 250 lbs. and the pressure used is to be 100 lbs., then the spring *s* is adjusted by the screw-plug so as to just touch the diaphragm. When one-half or so of the gas in the tank is used up, then the spring is adjusted by a few turns so as to increase the resistance of the diaphragm to the gas and restore the interior pressure to 100 lbs. Whenever the chauffeur observes a diminution in the light of the lamps, he gives a turn or two to the adjusting screw-plug, so that the gas-pressure in the casing is increased

and properly kept up for giving the proper degree of light. The spring is supported by the pin on the diaphragm and the screw-plug, but in such a manner that but little if any friction is exerted on the pin and thereby the sensitiveness of the diaphragm impaired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A pressure-regulator for tanks containing gas under pressure, comprising a cylindrical casing, an elastic diaphragm in said casing, a helical spring acting on one side of said diaphragm, a supply-pipe for the gas connected with the tank containing gas under pressure, a nozzle on said supply-pipe, a pendent plate provided with an elastic block forming contact with the discharge-orifice of said nozzle, means for adjusting said rubber block up or down relative to said nozzle, and means for connecting the lower end of the pendent plate with the elastic diaphragm.

2. In a pressure-regulator, the combination of a cylindrical casing, an elastic diaphragm held in position in said casing, a helical spring acting on one side of said diaphragm, means for adjusting the tension of said spring, a supply-pipe connected with a tank containing the gas under pressure, a nozzle at the end of said supply-pipe, a pendent plate hinged adjacent to the discharge-orifice of said nozzle and provided with an elastic block for opening or closing said orifice, means for vertically adjusting said pendent plate on the supply-pipe, and means for yieldingly connecting the lower end of said pendent plate with the center of the elastic diaphragm.

3. In a pressure-regulator, the combination of a cylindrical casing, an elastic diaphragm in said casing, a helical spring interposed between the elastic diaphragm and a screw-plug on the head of the casing, a supply-pipe, means for supplying gas under pressure, a nozzle on the inner end of the gas-supply pipe, a pendent plate hinged adjacent to the nozzle and provided with a block for opening or closing said nozzle, means for adjusting said pendent plate higher or lower on the inner end of the supply-pipe, and means for yieldingly connecting the lower end of the pendent plate with the center of the diaphragm.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

WILLIAM LEUCKERT.

Witnesses:

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J. A. COOK.