

No. 661,867.

Patented Nov. 13, 1900.

T. HAHN.  
GAS PRESSURE REGULATOR.

(Application filed Sept. 26, 1899.)

(No Model.)

Fig. 2.

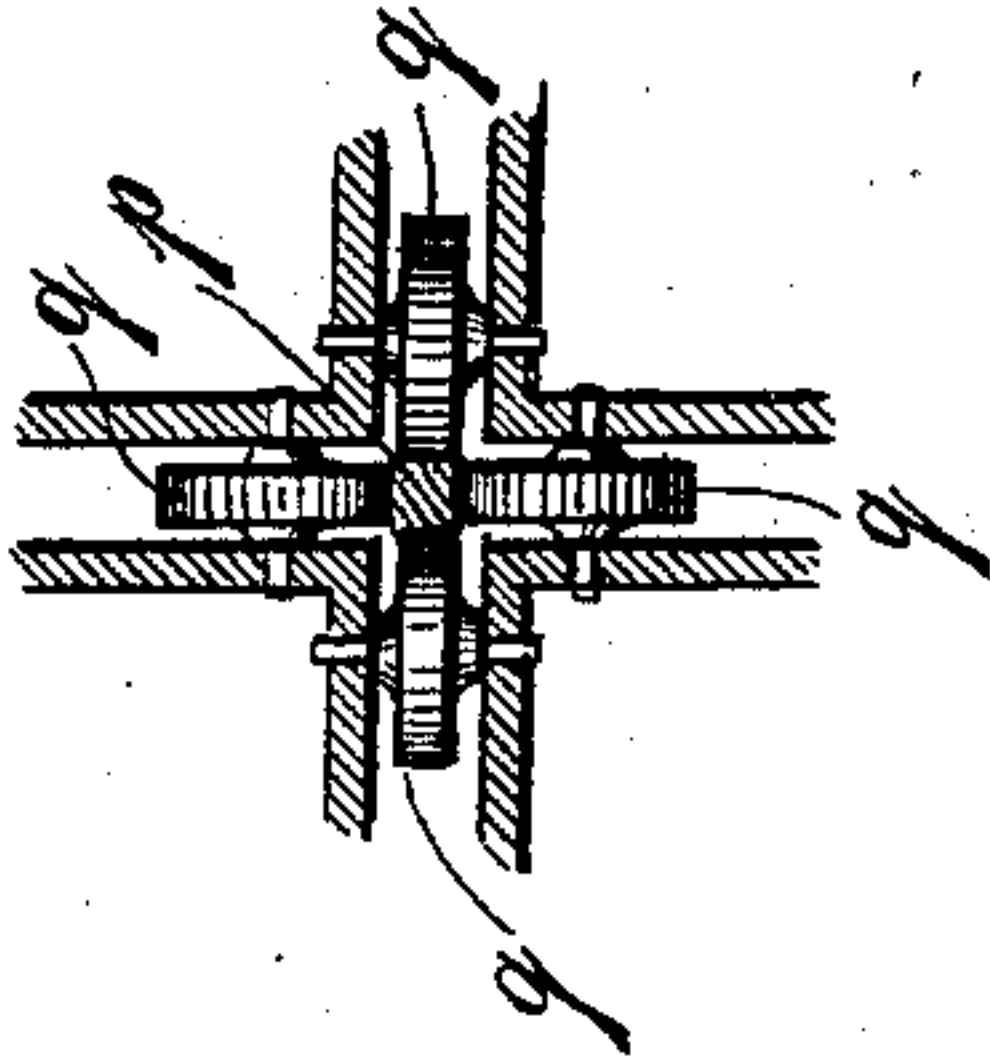
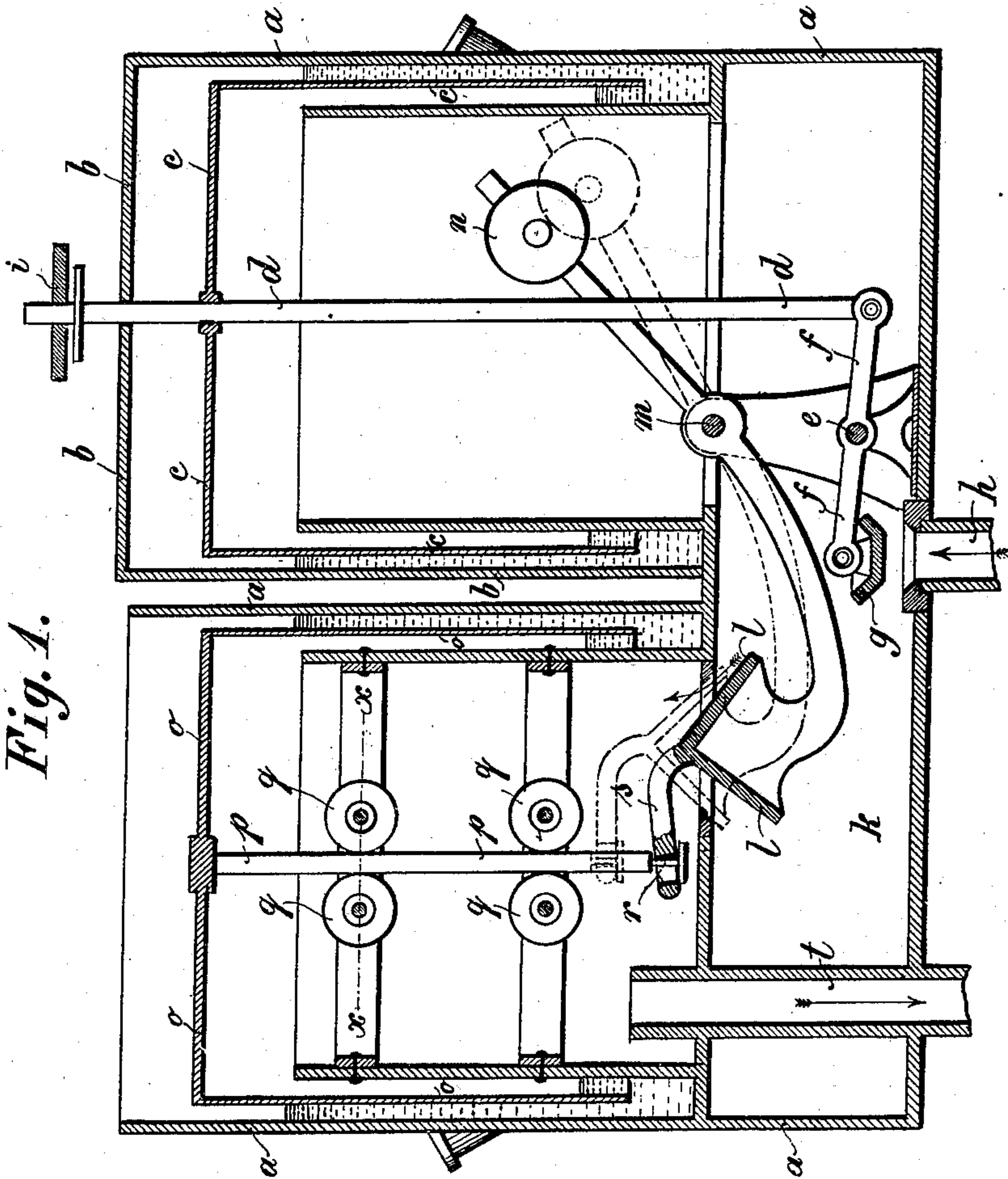


Fig. 1.



Witnesses:  
*Julius Lutz*  
*J. Macraeford*

Inventor:  
*Theodor Hahn*  
By *Munn & Co.*  
Attorneys.



# UNITED STATES PATENT OFFICE.

THEODOR HAHN, OF KÖTZSCHENBRODA, GERMANY, ASSIGNOR TO SIGISMUND MÜHLENTHAL AND MAX LOEWENTHAL, OF BERLIN, GERMANY.

## GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 661,867, dated November 13, 1900.

Application filed September 26, 1899. Serial No. 731,724. (No model.)

*To all whom it may concern:*

Be it known that I, THEODOR HAHN, a subject of the King of Saxony, residing at Kötzschenbroda, near Dresden, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Gas-Pressure Regulators, (for which I have applied for a patent in Germany, dated April 7, 1899,) of which the following is a specification.

10 The use of gas-engines and other apparatus with an intermittent gas-supply is accompanied by the disadvantage that in the gas-mains supplying the engines or other apparatus variations of the gas-pressure are perceptible.  
15 Many attempts have been made to remove this disadvantage by using gas-governors; but still the end in view has only been imperfectly attained, and gas-burners, for example, which were situated near to the motor or other apparatus have still only given  
20 an unsteady and flickering light. The reason that the apparatus hitherto used have not entirely removed these sudden pulsations of the gas in the mains is chiefly because these apparatus were only provided with a single gasometer-hood, which without being assisted by a special pressure-regulator opened and closed the valve which controlled the entrance of the gas to the hood. In such apparatus the  
25 gasometer-hood must be considerably displaced—when, for example, gas is sucked in by a gas-engine—and such hoods alone cannot therefore entirely prevent sudden variations of pressure in the main.

35 According to the present invention the gas before passing into the gasometer-hood which controls a gas-supply valve passes through a special pressure-regulator which is loaded in accordance with the friction of the gasometer-hood and in such a manner that the gas can  
40 pass into the gasometer-hood without perceptible impulses occurring in the regulator and gas-main. The channel connecting the gas-regulator and gasometer-hood is constructed sufficiently large as to allow the gas  
45 to pass without offering any resistance.

In the accompanying drawings one form of the invention is represented.

Figure 1 shows a vertical section of the apparatus; and Fig. 2 is a detail sectional view

on line  $xx$  of Fig. 1, the rollers being in elevation.

In the casing  $a$  a chamber  $b$  is provided, closed at the top and containing the gasometer-hood  $c$  of the gas-regulator, partially immersed in a liquid. This hood  $c$  is carried by a rod  $d$ , the top of which passes through the top of the chamber  $b$ , but without packing, so that the air between the hood  $c$  and the top of the chamber can slowly escape upon the hood rising, and thus exercises a retarding influence. The rod  $d$  is jointed to a two-armed lever  $f$ , pivoted at  $e$ , which lever carries a valve  $g$  at the other end. This valve  $g$  closes off the gas-main  $h$  more or less, and thereby regulates the pressure of the entering gas. A number of removable and exchangeable weights  $i$  can be applied to the rod  $d$  outside of the chamber  $b$ , the purpose of which will be further described below.

The gas entering from the main  $h$  passes into the gasometer-hood  $c$ , and in raising this latter the air above it is forced out of the apparatus, so that no shocks can occur. The position of the valve  $g$ , and consequently the pressure of the gas in the channel  $k$ , is dependent upon the position of the gasometer-hood  $c$ . Channel  $k$  is constructed of sufficient dimensions to allow the gas to pass to the opening of the valve  $l$  leading to the gasometer-hood  $o$  without sensible resistance. The valve  $l$  is supported by a relatively long two-armed lever pivoted at  $m$  and so balanced by a weight  $n$  that the valve  $l$  can be displaced by a very slight force. A central rod  $p$  and rollers  $q$  of proportionately large diameter guide a gasometer-hood  $o$ , so that it may rise and fall with as little friction as possible.

The manner of mounting the rollers  $q$  is represented in Fig. 2. At the lower end of the rod  $p$  a pin  $r$  is provided which engages in a slot at the end of an arm on the top of the valve  $l$ . This valve  $l$  is consequently only raised when the gasometer-hood  $o$  has been raised above a certain height and lowered when the end of the rod  $p$  above the pin  $r$  bears on the arm  $s$ .

The gas while entering the gasometer-hood  $c$  will likewise pass into the gasometer-hood  $o$  when the valve  $l$  is open and from thence



through the tube *t* to the engine or other apparatus. The gasometer-hood *o*, which rapidly rises and falls, is again quickly filled with gas without resistance by reason of the pressure on the regulator-hood *c*, and, further, because no sensible resistance is offered to the gas by the channel *k*, connecting the regulator-hood *c* and the gasometer-hood *o*. The weights *i* on the rod *d* are chosen according to the friction of the gasometer-hood *o*. When the hood *o* has to overcome greater friction in rising and falling, the weight *i* is increased, the valve *g* consequently further opened, and the gas then passes at a greater pressure through the valve *l*. The friction of the gasometer-hood *o* should, however, be kept as low as possible, so that the gas need only pass with relatively slight pressure into the apparatus. Inasmuch as the hood *c* is only able to move slowly and without shocks and a perfect balance of pressure exists between the two gasometer-hoods, it is evident that all shocks in the gas-main are entirely suppressed by means of this apparatus.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A gas-pressure equalizer for use with intermittent gas-consuming devices, comprising two gasometers connected one with the supply-pipe and the other with the delivering-pipe, a valve mounted upon a pivoted lever and adapted to close the communication between the two gasometers, connections from said valve to the bell of the gasometer which is connected with the delivering-pipe, a counterweight on said lever whereby the valve is closed by the rise of the gasometer-bell, a valve between the other gasometer and the supply-pipe, a pivoted lever carrying said valve, and connections from said lever to its gasometer-bell adapted to close the valve when the bell rises, substantially as described.

2. A gas-pressure equalizer for use with intermittent gas-consuming mechanisms, comprising two gasometers, consisting of two concentric walls forming a water seal, a bell fitting between the said walls and forming a gasometer, one of said gasometers being connected with the supply-pipe and the other with the delivering-pipe, the outer wall of the gasometer which is connected with the supply-pipe having a top or cover, a rod passing upwardly from the bell of said gasometer loosely through said cover and adapted to receive variable weights on its projecting end, a valve between said gasometer and the supply-pipe, connections therefrom to the bell whereby the valve is closed by the rise of the bell,

a valve between the two gasometers, a pivoted lever carrying said valve, a rod connecting said gasometer-bell with its valve-lever to close it when the pressure rises, and connections from said gasometer to the gas-consuming mechanism, substantially as described.

3. A pressure-regulator, comprising two gasometer-hoods *c o*, one of which *c* is surrounded at the top by an air-cushion, a channel below the hoods and into which opens the supply-pipe, said channel having an unobstructed communication with the hood *c*, a valve for controlling the supply-pipe, operatively connected with the hood *c*, a valve controlling the communication between the channel and the hood *o*, and operatively connected with said hood, and a delivery-pipe leading from the hood *o* out through said channel, substantially as described.

4. A pressure-regulator, comprising two gasometer-hoods *c o*, one of which *c* is surrounded at the top by an air-cushion, a channel below the hoods and into which opens the supply-pipe, said channel having an unobstructed communication with the hood *c*, a pivoted lever in the channel, a valve on one end of the lever for controlling the supply-pipe, a rod secured to the lever and to the bell *c* and having a weight on its upper end, a pivoted and weighted lever, a valve on the end of the lever and controlling the communication between the channel and hood *o*, a rod secured to the said hood and to an arm on the valve, and a delivering-pipe leading from the hood *o* out through the said channel, substantially as herein shown and described.

5. In a pressure-regulator, the combination with a chamber into which opens the supply-pipe, two gasometer-hoods *c o* arranged above the chamber and with which chamber the hood *c* has an unobstructed communication, and a valve, for controlling the supply-pipe, operatively connected with the hood *c*, of a rod depending from hood *o* and having guided movement, a pivoted and weighted lever, and the valve *l* secured to one end of the lever and provided with the arm *s* loosely connected with the rod of hood *o*, said valve controlling communication between the said hood and chamber, substantially as described.

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

THEODOR HAHN.

Witnesses:

HERNANDO DE SOTO,  
PAUL ARRAS.