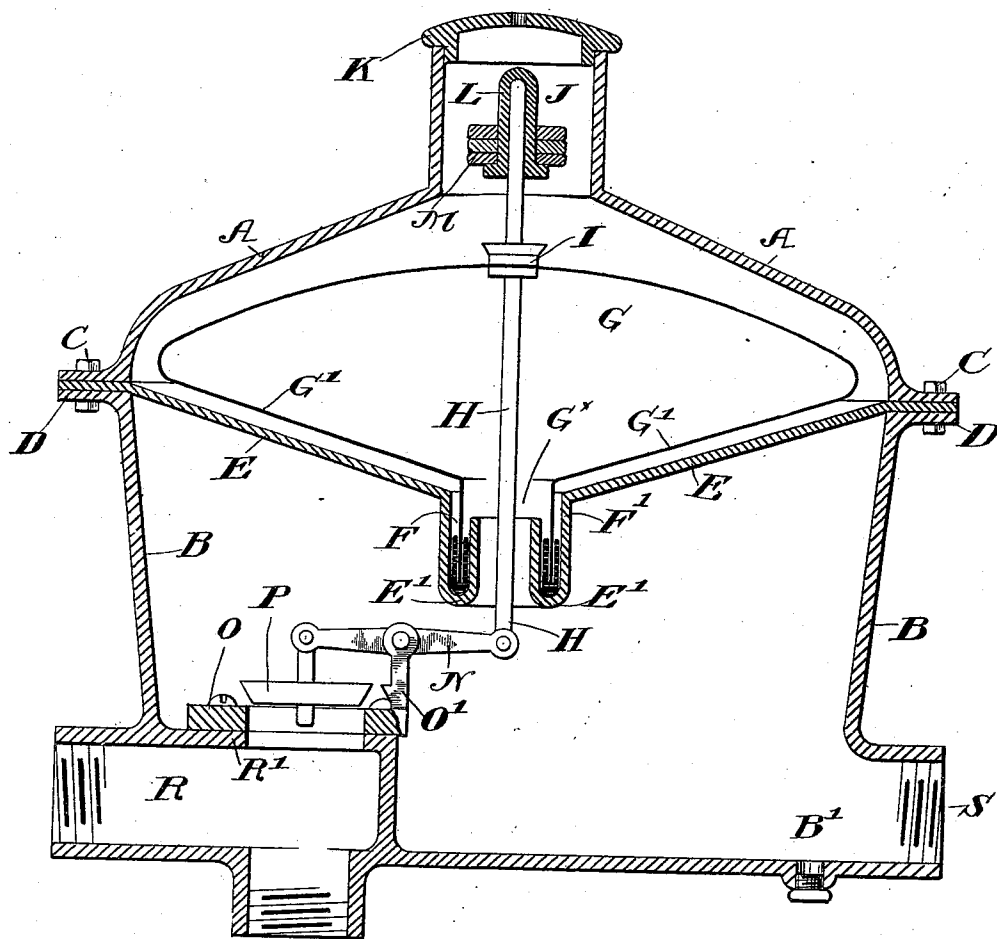


(No Model.)

R. BRAME.
GAS PRESSURE REGULATOR.

No. 494,699.

Patented Apr. 4, 1893.



WITNESSES:

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ROBERT BRAME, OF ALLEGHENY, ASSIGNOR TO E. A. WEART, OF PITTSBURG,
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GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 494,699, dated April 4, 1893.

Application filed May 24, 1892. Serial No. 434,230. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BRAME, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Pressure Regulator; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in gas-pressure regulators, and particularly to that class of such regulators wherein a moving diaphragm is actuated by the pressure of the gas within a casing to close the inlet valve thereto, the same being counterbalanced by suitably applied weights, and the object of my invention is to provide a device of this character which shall present advantages of simplicity, economy and durability of construction, all as will be more fully hereinafter set forth.

The novel features of my invention will be carefully defined in the claim.

In order that my invention may be the better understood, I have illustrated in the accompanying drawing a cross section of a pressure regulator embodying my improvements.

In the drawing B represents the main lower portion or body of the casing provided with an inlet R and an outlet S, and having in its bottom a vent or plugged opening B' for withdrawing any liquid or other sediment which may collect therein.

Arranged across the inlet R is a perforated partition R' having a smooth upper face, to which is secured by means of screws or the like, a flat plate O, having a perforation corresponding with the aperture in the partition R' as clearly seen. The upper edge of this perforation in plate O is ground to form a circular valve-seat and from the inner edge of said plate O projects an upright O', on the upper end of which is fulcrumed a lever N, having one end loosely coupled to the stem of a valve P, adapted to fit and enter said valve-seat in plate O, whereby the passage of the gas from the inlet R to the chamber formed by the body B of the casing may be regulated. By this construction, it will be seen that considerable economy is effected no work being necessarily put upon the casing B after it has been formed, and the construc-

tion being such that it is only necessary to secure the plate O with its valve and lever in place on said partition R'.

The body portion B of the casing is provided with a projecting flat flange or lip D, around its upper edge over which fits the cap or cover A, having a similar annular lip, said lips having openings formed in them for the passage of bolts or screws C, C, whereby they are secured together as will be readily understood.

Clamped fast between the cap A and body B of the casing is an annular partition E, of a general inverted cone-shape having a central opening E' and a depending hollow flange or lip F' forming a contracted annular chamber F, surrounding said opening E' as clearly seen in the drawing. The cap A has a general rounded upper face and a central neck J provided with a perforated removable cover or plug K, the purpose of which will be hereinafter explained.

Arranged in the space between the partition E and cap A, is the diaphragm G, of thin sheet metal, having an enlarged upper portion the upper face of which is rounded, and the lower face G' of which is coned to correspond with the coned upper face of the partition E, as clearly seen. This diaphragm G is also provided with a depending contracted central neck G^x arranged to enter the contracted annular chamber F, at the center of the partition E.

H is a rod connected at its lower end to the free end of the lever N, and passing upward through the central aperture E' of the partition E and through the neck G^x of the diaphragm G, into the upper enlarged portion of said diaphragm. Said rod passes through the upper wall of said diaphragm being provided with nuts I, for making a gas tight joint and has its upper extremity arranged within the contracted neck of the cap A, immediately beneath the cover K, thereof. On its upper end said rod is provided with a cap L, having a rounded upper end and a flange about its base, whereon may be hung weights M, M, as clearly seen in order to regulate the movements of said diaphragm G.

So far as described, the apparatus is ready for being put in connection with the gas pipes

for use, and when it is desired to put it in connection for service, it is only necessary to couple the gas supply pipe to the inlet R, and the burner pipe to the outlet S of the casing

5 B. Before turning on the gas, a small quantity of mercury is poured through the opening in cover K, and falls down over the upper rounded surface of cap L and diaphragm G onto the coned and inwardly inclined upper
10 face of the partition E, into the annular chamber F, at the center thereof. Sufficient mercury having been introduced to seal the lower end of the neck G^x of the diaphragm, the gas may be turned on. The gas flows from the
15 inlet through the apertures in partition R' and plate O, under the valve P, into the body of the casing B, and up through the neck of the diaphragm G into the enlarged upper portion thereof. Should the pressure in the casing B from any cause rise above the normal
20 it will lift the diaphragm G slightly and act through the lever N to close the valve P into the valve-seat in plate O whereby the inflow of gas is cut off until such over pressure is removed by the flow of gas from the outlet S.

By the employment of the contracted annular chamber F of the partition E, and the contracted neck G^x of diaphragm G, it will be seen that a very small quantity of mercury
30 suffices to perfectly seal the lower end of said diaphragm, and as mercury is very heavy and comparatively expensive, yet very desirable for such purposes, this construction presents a very important economy over other devices hitherto employed. Moreover, by giving the partition an inverted cone shape with the chamber F at the center, the introduction of the mercury to said chamber after the apparatus is set up ready for use is greatly facilitated, and at the same time by giving the under side G' of the diaphragm G, a form corresponding to the coned upper face of said partition E, a very compact construction is provided.

45 I claim—

In a gas pressure regulator, the combina-

tion with a casing comprising a lower section having an inlet and an outlet, and a dome shaped upper section said sections having annular projecting flanges, of an inverted, coniform partition having a flat annular rim
50 clamped between said sections of the casing, said partition having a cylindrical depending lip having a contracted central cylindrical opening extending through it and communicating between the two chambers formed in the casing by the partition, said neck having a vertical annular chamber formed in it to receive mercury to form a seal, the inner wall of said chamber lying below the beveled
60 upper face of said partition, said inner wall forming the outer wall of said central opening, a diaphragm, having an enlarged rounded upper portion, the upper side of which conforms to the dome shaped upper section of the casing and the lower side of which is beveled to conform to the coned upper face of the partition, said diaphragm having a central contracted cylindrical neck depending from its under side into the annular chamber formed
70 by the hollow of the neck and adapted to be sealed by the mercury therein, a stem, connected at its upper end to the enlarged upper portion of said diaphragm and extending down through the neck thereof below the depending lip of the partition, an apertured partition arranged over the inlet to the casing, a bearing plate provided with a valve seat coinciding with the opening in said partition and having also an upwardly projecting arm,
80 a lever pivoted in the arm of said bearing plate and connected at one end to the stem of the diaphragm, and a valve connected to the other end of said lever and adapted to fit the valve seat of the bearing plate, substantially as set forth.

In testimony whereof I have hereunto set my hand this 22d day of March, A. D. 1892.

ROBERT BRAME.

Witnesses:

A. C. JOHNSTON,
C. S. JOHNSTON.