S. BROWN.

PRESSURE REDUCER.

APPLICATION FILED MAR. 11, 1912.

1,042,078.

Patented Oct. 22, 1912.

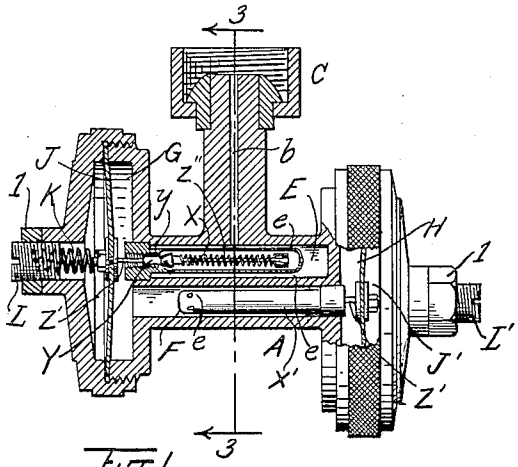

Fig. 1.

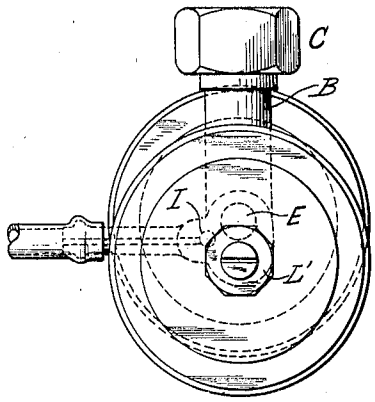

Fig. 2.

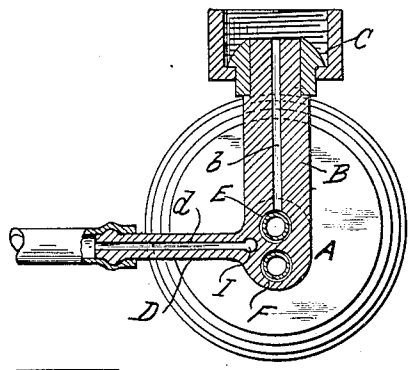

Fig. 3.

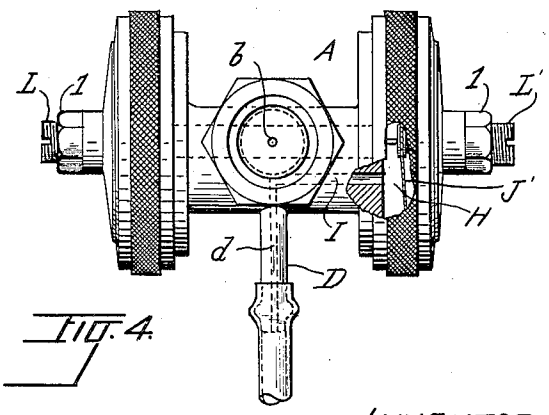

Fig. 4.

WITNESSES:

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PRESSURE-REDUCER.

1,042,078. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed March 11, 1912. Serial No. 682,949.

To all whom it may concern:

Be it known that I, STEWART BROWN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pressure-Reducers, of which the following is a specification.

This invention relates to devices which are attachable to tanks containing air or gas under pressure and through which air or gas flows and thereby the pressure of said air or gas is reduced and is discharged on the opening of a cock at a pressure less than the pressure in the tank.

To those skilled in the art it is well known that the pressure in a freshly filled tank containing acetylene gas is considerable over 200 pounds per square inch while the pressure at the burners of an acetylene lamp is desired to be about two ounces and that as the gas is used from said tank the pressure thereof is constantly lessened; and the objects of this invention are to obtain an economically made device which is easily attachable to a tank, and by means of which the pressure of the gas delivered from said tank and flowing through the device will be substantially constant, notwithstanding the variation in pressure of the gas in the tank from the initial discharge of gas therefrom up to the time when the pressure therein is not in excess of substantially two ounces.

A further object of the invention is to obtain a device which, when located between a tank containing gas under considerable pressure and an ordinary gas cock will, at all times, (when the gas cock is closed as well as when it is opened) reduce the pressure of the gas at said gas cock to substantially two ounces; thereby permitting the use of an ordinary gas cock to control the discharge of gas to the burner of a lamp, or lamps. And a still further object of the invention is to obtain a device which, when interposed between a tank containing gas under pressure and the burner of a lamp, will maintain a uniform and predetermined pressure at said burner, and permit the flow of the gas in said tank therethrough until the pressure in the tank has been reduced to said determined pressure.

In the drawing Figure 1 is a longitudinal vertical view of a device embodying this invention. Fig. 2 is an end elevation of said device. Fig. 3 is a section on line 3—3 of Fig. 1, viewed in the direction indicated by the arrows. Fig. 4 is a top plan view.

Similar letters refer to similar parts throughout the several views.

A is the body part of the device, and B, D, are stems which are respectively provided with passage ways *b*, *d*, therein. Stem B is provided with the union C by means of which the device is attachable to a discharge pipe of a tank or other article.

E, F, are passage ways in body part A. G, H, are chambers at the ends of said body part. Passage way *b* communicates with passage way E and passage way E communicates with chamber G, through valve X hereinafter described. The passage way F communicates with chamber G and with chamber H through valve X′ hereinafter described, and I is a passage way in body part A which communicates with chamber H and with passage way *d*.

J, J′, are diaphragms in chambers G, H, respectively.

K, (Fig. 1), is a coiled spring. A coiled spring K is placed in each of the chambers G, H, so that the front ends thereof press against the diaphragms J, J′, respectively, yieldingly holding said diaphragms in the position illustrated in Fig. 1. The back end of the springs K, abut against the screws or bolts L, L′, respectively. Screws or bolts L may be turned into position so that a determined pressure of the gaseous contents of chambers G and H on diaphragms J, J′, is required to force said diaphragms back a determined distance against the resiliency of springs K, and said bolts may be locked in place by nuts 1.

Valves X, X′, which I prefer to use, respectively consist of a casing having a cham-

ber therein, which chamber in valve X is in communication with passage way E through apertures *e*, and with the chamber G through passage way Y. In valve X the chamber in the casing thereof is in communication with passage way F through apertures *e* and with chamber H through passage way Y thereof. The passage way Y is provided with valve seat *y*.

Z is the valve of valve X co-acting with seat *y*, and is provided with stem Z'. Valve Z is yieldingly held seated on seat *y* by spring Z''. The stem Z' of the valve X which is in passage way E, projects into said chamber when said valve is closed and said stem of the valve X' which is in passage way F projects into chamber H, when said valve is closed.

The spring K in chamber G is so adjusted, by means of screw or bolt L that when gas flows from passage way *b* into said chamber to obtain a maximum determined pressure in said chamber (say 3 or 4 pounds) the said pressure on diaphragm J will force said diaphragm back against the resilience of spring K and permit the spring Z'' to seat valve Z. When less than the determined maximum pressure exists in chamber G the spring K forces the diaphragm J forward, moving the valve Z off of its seat, against the resilience of spring Z'', thereby permitting the flow of gas through passage ways *b* and E into said chamber G.

Valve X' is placed in passage way F in the same manner as valve X is placed in passage way E and with stem Z' thereof in the same relation to diaphragm J'.

As hereinbefore stated the valve X' is constructed the same as valve X, and the diaphragm J' and spring K thereto are constructed and operated in the same way, as are diaphragm J and spring K; but said diaphragm J' and spring may be much lighter and more delicate or sensitive in operation than said diaphragm J and spring K, as the pressure thereon is measured in ounces, and not in pounds, and the variation in the source of supply, (chamber G) is more constant, at no time being greater than the maximum determined on, and hence, I am able to deliver gas from chamber H through the passage way *d* at a substantially uniform pressure, say two ounces.

I have found, in practice, that without using a very sensitive diaphragm J and spring K the pressure in passage way *b* may vary from about two hundred and fifty pounds per square inch to about two ounces and (the spring K being adjusted so that the maximum pressure in chamber G will be about four pounds), there will be but little variation of pressure in said chamber G, as the pressure in passage way *b* falls, until after the pressure in said passage way *b* is less than said four pounds, and that thereafter the pressure in said chamber will be the same as the pressure in said passage way *b*. With the pressure in chamber G not varying more than say half a pound there may be used in chamber H a very sensitive diaphragm J and spring K. The spring K and diaphragm J' in said chamber H, may, therefore, be adjusted so that the variation of pressure in said chamber H is a negligible quantity, said pressure being substantially constant, whether the pressure in passage way *b* be two ounces or two hundred and fifty pounds per square inch.

I claim:

1. In a pressure reducer, a body provided with enlarged ends, said ends respectively provided with a recess, stems integral with and extending outward from said body, said stems positioned between said enlarged ends, diaphragms on said enlarged ends, caps respectively mounted on said enlarged ends to maintain said diaphragms in position to form a movable wall to chambers which are obtained by said recesses and diaphragms, said stems respectively provided with a passage way, one of said passage ways extended through said body and communicating with one of said chambers to form the inlet thereto, and the passage way in the other of said stems extended through said body and communicating with the other of said chambers to form the outlet therefrom, and said body provided with an additional passage way therethrough communicating with both said chambers to form the outlet from the first named chamber and the inlet to the other of said chambers, in combination with a valve seat in the first named passage way, a valve to co-act with said valve seat, means to yieldingly hold said valve on its seat, an additional valve seat in the passage way communicating with both said chambers, a valve to co-act with said additional seat, means to yieldingly hold said last named valve on its seat, and manually controllable means respectively positioned in said caps to yieldingly force said diaphragms forward to unseat said valves.

2. The combination of a body consisting of a central part provided with stems and provided with enlarged ends, said enlarged ends respectively provided with a recess, caps on said enlarged ends, said caps provided with screw threads fitting corresponding screw threads on the enlarged ends, and diaphragms secured in place over said recesses by said caps to obtain chambers, passage ways in said body and in the stems thereon respectively forming inlets to and outlets from said chambers, and a passage way through said body communicating with both said chambers and forming an inlet to one of said chambers and an outlet to the other

chamber, valve seats and valves to co-act with said seats, respectively arranged to control the inlets to said chambers, said diaphragms arranged to unseat said valves when in an advanced position and to permit said valves to seat when in a retracted position, and manually controlled means to yieldingly hold said diaphragms in an advanced position with an adjustably determined pressure.

STEWART BROWN.

In the presence of—
CHARLES TURNER BROWN,
CORA A. ADAMS.