

[72] Inventor Friedrich-Wilhelm Hill
Hamburg, Germany
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[73] Assignee AGA Aktiebolag
Lidingo, Sweden
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Primary Examiner—Samuel Scott
Attorney—Larson, Taylor & Hinds

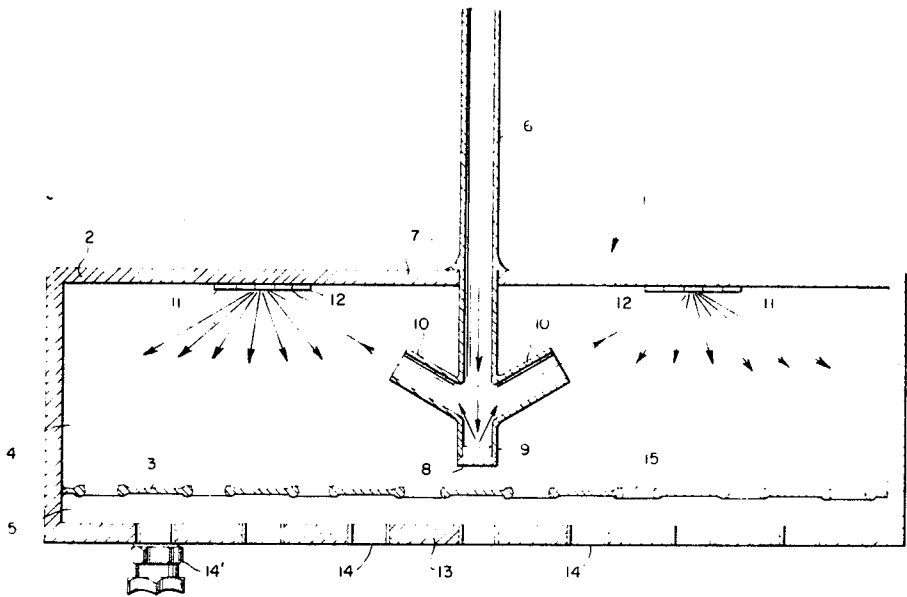
[54] **DEVICE FOR THE PRODUCTION OF A UNIFORM GAS PRESSURE**
8 Claims, 1 Drawing Fig.

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[51] Int. Cl.....	F17d 1/10
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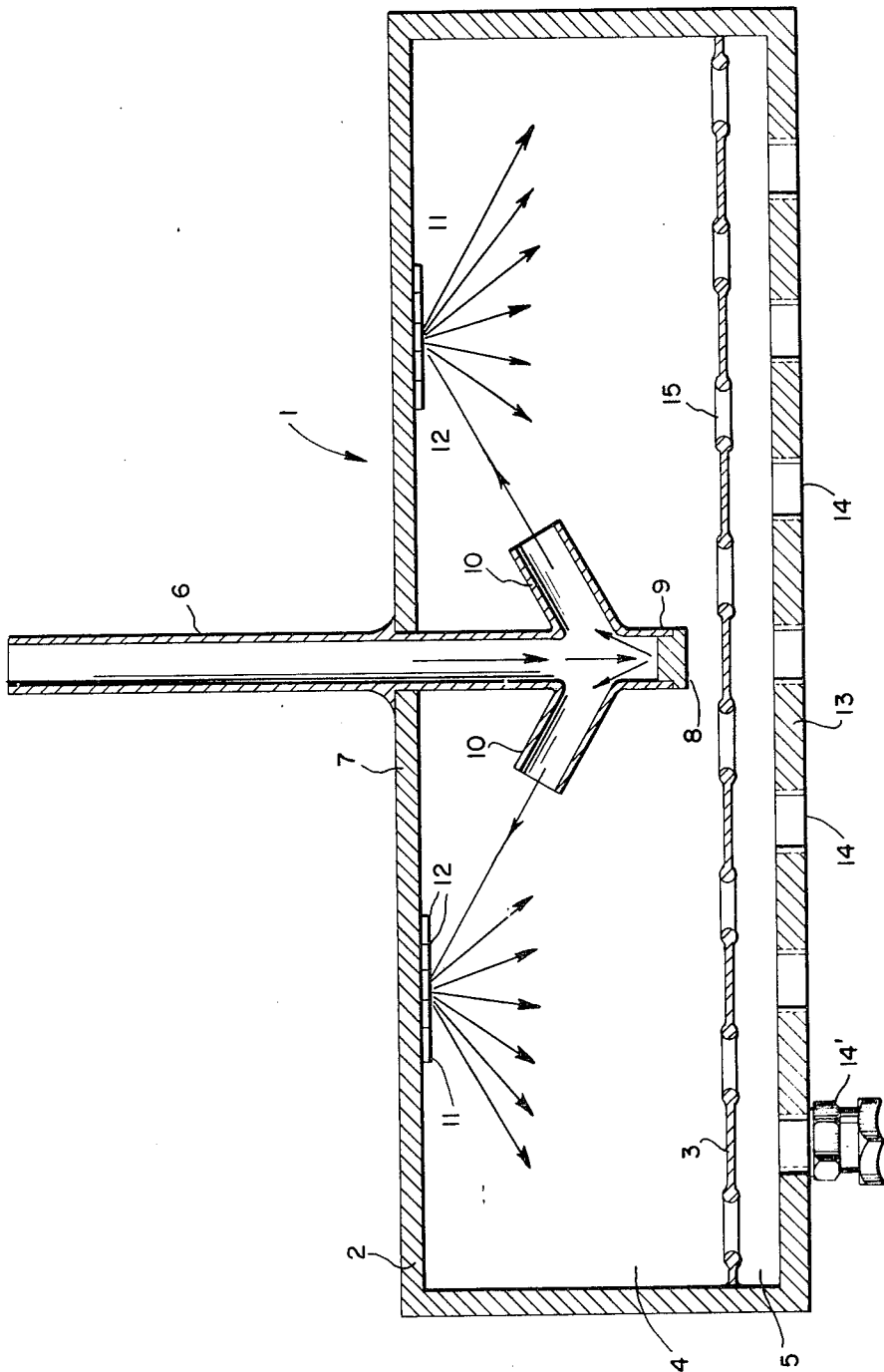
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ABSTRACT: Device for the production of a uniform gas pressure for a plurality of pressure gas consumers. It comprises a tank divided by an intermediate wall into an equalizing chamber and a calming chamber. A gas inlet is attached to the equalizing chamber and it has a plugged tubular end a short distance away from the intermediate wall. The inlet is provided with several nozzles closely above the plug which nozzles direct gas flow against impingement surfaces placed opposite the intermediate wall in the equalizing chamber. The intermediate wall has openings for the gas passage to the calming chamber, which is provided with a gas outlet for each consumer.



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INVENTOR

FRIEDRICH-WILHELM HILL

BY *Larson and Taylor*
ATTORNEYS

DEVICE FOR THE PRODUCTION OF A UNIFORM GAS PRESSURE

The invention relates to an apparatus for the production of a uniform gas pressure for a plurality of gas consumers. The invention has particular applicability for supplying oxygen gas under pressure or compressed air to a plurality of diffusion burner sets, combined into one flame jet burner assembly.

Although the apparatus of the invention has been developed especially for diffusion burner sets, as described in the German patent application No. P 19 130 14.4, the invention is not limited to this field of application. It can be used wherever precision maintenance of a uniform gas pressure for supplying several consumers is required.

The apparatus will be described with reference to its use with diffusion burner sets where, for example, each diffusion burner set of the flame jet burner assembly is supplied separately with oxygen gas under pressure or compressed air and a fuel gas, preferably acetylene, from two storage tanks, placed closely together. The maximum oxygen gas pressure or compressed air pressure is 4.5 atmosphere and the acetylene pressure is 0.6 atmosphere.

If the oxygen gas or the air is to be supplied to several burner sets, the oxygen tank or the compressed air tank must be provided with as many connections as burner sets used. To produce a uniform flame jet formation at all burner sets, it is absolutely essential that the pressure at all outlet nozzles of the oxygen or the compressed air tank, which are connected with the burner sets, is exactly the same.

This object is achieved in accordance with the invention of a tank having an intermediate wall therein dividing the tank into a equalizing chamber and a calming chamber gas inlet means extends into the equalizing chamber and is adapted to direct gas flow against an impingement surface opposite the intermediate wall in the equalizing chamber. The intermediate wall is provided with a plurality of openings through which gas may pass from the equalizing chamber to the calming chamber. A plurality of gas outlet means are provided the tank opposite the intermediate wall for removal of gas from the calming chamber.

In order to achieve initially as uniform a distribution as possible of the gas flowing into the equalizing chamber, the gas inlet means advantageously projects into the equalizing chamber of the tank and is adapted to divide the incoming gas into several jets, each of which is directed against the aforementioned impingement surface. The gas inlet means in preferably a tubular gas supply connection possessing a suitably designed plugged pipe, ending a very short distance above the intermediate wall. Discharge nozzles directed towards the impingement surfaces are attached to the tubular gas supply pipe a short distance above the plug.

To still further assist the uniform distribution of the gas flowing into the equalizing chamber, the impingement surface or surfaces is, or are, fitted with corrugations.

Furthermore, it has proved to be expedient to arrange the openings in the intermediate wall staggered in respect of the gas outlet nozzles of the calming chamber.

To obtain equal pressures at the gas outlet nozzles, it is important that the volume of the calming chamber be considerably less than the volume of the equalizing chamber.

The establishment of equal pressures is further assisted by making the cross-sectional area of each gas opening in the intermediate wall substantially equal to the cross-sectional area of the gas inlet connection.

An embodiment of the subject of the invention will now be described with reference to the attached drawing. The diagrammatic representation of the device of the invention shown in the drawing is a section through the central plane.

The apparatus indicated generally as 1 consists of tank 2, which is divided by an intermediate wall 3 into an equalizing chamber 4 and a calming chamber 5. The volume of the equalizing chamber 4 is a multiple of the volume of the calming chamber 5. A tubular gas inlet connection 6 passes through the one wall 7 of the tank 2 and extends into the

equalizing chamber 4 within a short distance from the intermediate wall 3. The end 9 at the gas inlet connection 6 is closed by a plug 8. At a short distance above the closed end 9 several nozzles 10 are attached to the tubular gas inlet connection 6, and inclined upwards in the drawing. The nozzles 10 divide the gas flow into several gas streams and project the gas upwards against the wall 7 of the tank 2, as indicated by the arrows. An impingement surface 11 provided on the wall 7 is assigned to each nozzle 10, against which the gas jet from the nozzle is directed and from where it is deflected in turbulent flow. The impingement surfaces 11 are provided with corrugations 12 which cause further turbulence of the impinging gas stream. The pressure of the gas entering through the nozzle is thus uniformly distributed across the entire equalizing chamber 4.

A series of gas outlets 14 with connections 14 from the calming chamber 5, one connection for each consumer, are provided in the wall 13 of the tank 2 opposite the wall 7.

The intermediate wall 3, placed parallel with and between the two tank walls 7 and 13 is provided with a series of openings 15, which are staggered in respect of the gas outlets 14 with their connections 14, and which provide the communication between the equalizing and calming chamber 4 and 5, respectively. The cross-sectional area of each opening 15 is substantially equal to the inside cross-sectional area of the gas inlet connection 6.

The device operates in the following manner:

The laminar gas flow from the nozzle 10 is changed into a turbulent flow, when it strikes against the impingement surfaces 11 with corrugations 12, with the result that the gas has no longer a definite vector, (otherwise, Heron's law of reflection would apply) but is pressed in random distribution against the intermediate wall 3 through the openings 15 whereof it then passes into the calming chamber. The openings 15 of the intermediate wall 3 convert the turbulent flow back again to laminar flow. As the volume of the calming chamber 5 is relatively small, the gas passes now through all gas outlets connections in laminar flow and at equal pressure. Measurements have shown that the pressure difference between one gas outlet nozzle and another in the device as described above is 0.01 percent of approximately or expressed in another way 10^{14} kp/cm.².

It has already been mentioned that the apparatus of the invention is particularly suited for use in conjunction with diffusion burners which are combined to a flame jet unit, in order to supply all burners with oxygen gas under pressure or compressed air of equal pressure. It is obvious, however, that the apparatus can be used wherever several pressure gas consumers must be supplied with absolutely identical pressures.

It is claimed:

1. An apparatus for supplying a uniform gas pressure to a plurality of consumers which comprises a tank, an intermediate wall disposed in said tank dividing said tank into an equalizing chamber and a calming chamber, gas inlet means extending into said equalizing chamber and adapted to direct gas against an impingement surface opposite said intermediate wall, openings in said intermediate wall for the passage of gas from the equalizing chamber into the calming chamber and a plurality of gas outlet means in said tank opposite said intermediate wall for removal of gas from the calming chamber.

2. The apparatus of claim 1 wherein the openings in said intermediate wall and the gas outlet means are in a staggered relationship to each other.

3. The apparatus of claim 1 wherein the volume of the equalizing chamber is a multiple of the volume of the calming chamber.

4. The apparatus of claim 1 wherein the gas inlet means is adapted to divide the incoming gas into a plurality of jets each of which is directed against an impingement surface opposite said intermediate wall.

5. The apparatus of claim 4 wherein the impingement surface is provided with corrugations.

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6. The apparatus of claim 4 wherein the gas inlet means comprises a tubular gas inlet connection having a plugged end a short distance from the intermediate wall and a plurality of nozzles communicating with said tubular gas inlet connection a short distance from said plugged end, each of said nozzles being positioned to direct gas flow against an impingement surface opposite said intermediate wall.

7. The apparatus of claim 3 wherein the cross-sectional area of each of the openings in said intermediate wall is substantially equal to the cross-sectional area of said tubular gas inlet connection.

8. An apparatus for supplying a uniform gas pressure to a plurality of consumers which comprises a tank, an intermediate wall in said tank dividing said tank into an equalizing chamber and a calming chamber, said equalizing chamber having a volume which is a multiple of the volume of the calming chamber, a gas inlet means extending into said equalizing

chamber, said gas inlet means comprising a tubular gas inlet connection having a plugged end a short distance from the intermediate wall and a plurality of nozzles communicating with said tubular gas inlet connection a short distance from said plugged end, each of said nozzles being positioned to direct gas flow against an impingement surface opposite said intermediate wall, openings in said intermediate wall for the passage of gas from the equalizing chamber to the calming chamber, each of said openings having a cross-sectional area substantially equal to the inside cross-sectional area of said tubular gas inlet connection, a plurality of gas outlet means in said tank opposite said intermediate wall for removal of gas from the calming chamber, said openings in said intermediate wall and said gas outlet means being in a staggered relationship to each other.

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