

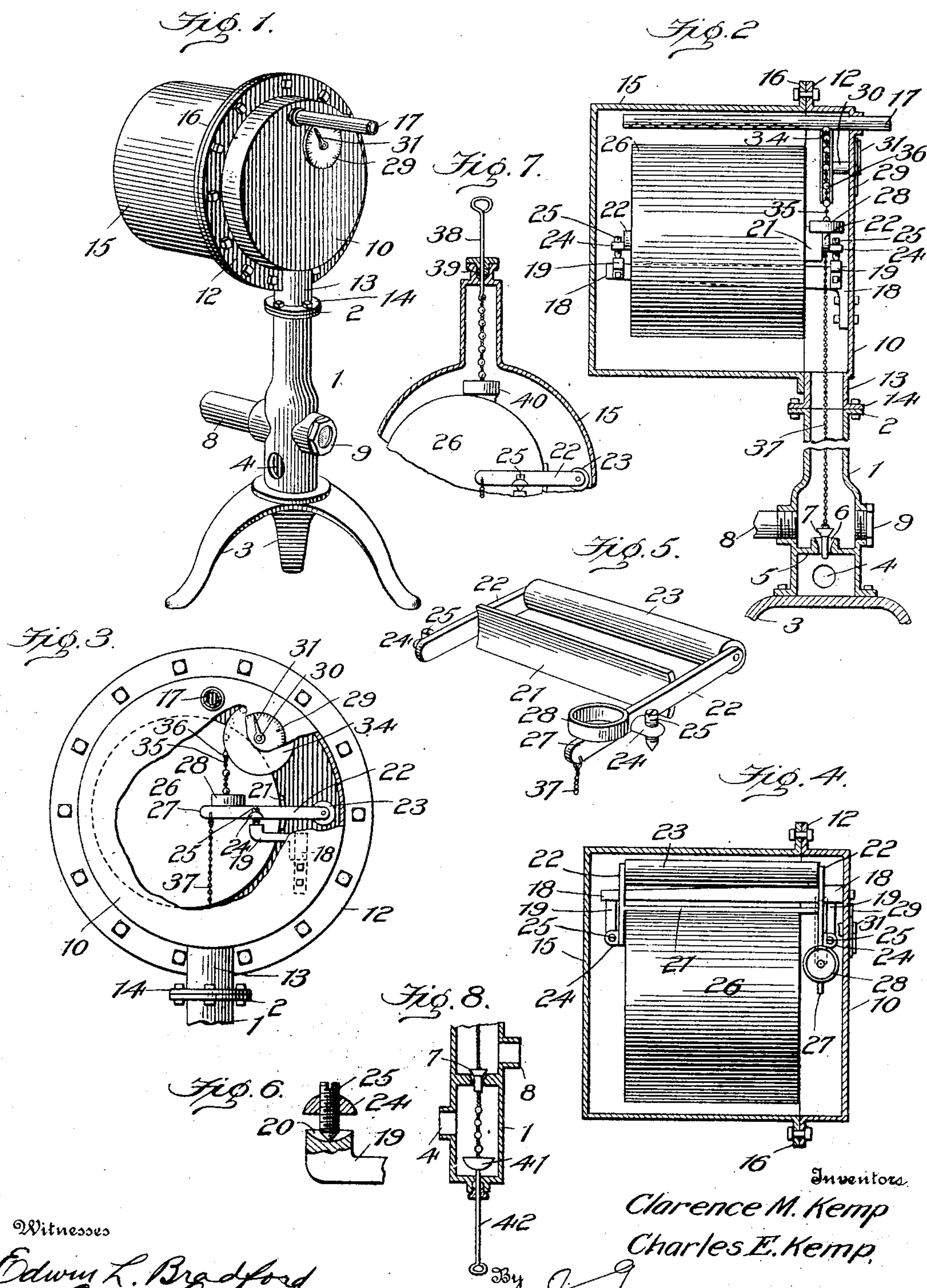
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GAS MIXER OR APPARATUS FOR REGULATING THE QUALITY OF GAS.

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GAS-MIXER OR APPARATUS FOR REGULATING THE QUALITY OF GAS.

No. 803,490.

Specification of Letters Patent.

Patented Oct. 31, 1905.

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To all whom it may concern:

Be it known that we, CLARENCE M. KEMP and CHARLES E. KEMP, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented new and useful Improvements in Gas-Mixers or Apparatus for Regulating the Quality of Gas, of which the following is a specification.

Our present invention relates to certain new and useful improvements in gas-mixers or apparatus for regulating the quality of gas; and it has for its purpose to provide a simple, safe, and compact device or apparatus of the character set forth especially constructed to meet all the demands usually placed on an apparatus of this type.

It is a well-known fact that air-currents charged with hydrocarbon vapors of naphtha, gasoline, or the like from carbureters and designed for the purpose of illumination vary from time to time in the degree of saturation thereof, thus causing corresponding variations in the illuminating power of the gas, and a great deal of the time this gas is surcharged to such an extent as to cause considerable smell and smoke in the burning of the gas, which is of course very objectionable. It is also well known that the density, gravity, or weight of the gas thus formed varies with the degree of its saturation by the vapors of the naphtha, gasoline, or the like and that by a proper admixture of air with the vapors a uniform gas of unvarying candle-power may be produced. Our present invention, therefore, aims to take advantage of these well-established facts or laws and to provide an apparatus simple in construction, safe and efficient in operation, and readily adjustable in certain respects, whereby to automatically effect such regulation in the proportions of air and hydrocarbon vapors as to obtain the best possible results from such mixtures and also to provide a device wherein no wastage of gas is possible, which is an objection present in the known forms of apparatus designed for the purpose.

The invention comprises the features of construction and combination and arrangement of parts hereinafter described in detail and then more definitely pointed out in the claims.

In the annexed drawings, Figure 1 is a perspective view of a gas mixing and regulating

apparatus constructed according to the present invention. Fig. 2 is a vertical section thereof. Fig. 3 is a front elevation of the head of the apparatus, a part of the front thereof being broken away to show some of the interior parts. Fig. 4 is a transverse section through the head. Fig. 5 is a perspective view of the balance-frame, the float being removed. Fig. 6 is a detail section of the point-bearing for the balance-frame, and Fig. 7 and 8 are detail sectional views of slightly-modified forms of means for adjusting the balance of the counterbalance-frame through the medium of a chain having attached weights.

Referring to the drawings, Fig. 1, the reference-numeral 1 designates a hollow vertically-disposed post or pedestal closed at its lower end and provided at its upper end with an offstanding annular flange 2, said pedestal being supported upon feet 3 or upon any other suitable form of base. At the lower end of the hollow post or pedestal 1 is an air-inlet pipe or opening 4, and above this opening is an internal transverse partition 5, provided with an opening 6, having a valve-seat with which a valve 7 coöperates, said valve being constructed and arranged to open and close the said opening to a greater or less extent as occasion may require and as will more fully hereinafter appear. A gas-inlet pipe 8 is tapped into an opening in the side of the post or pedestal 1 at a point immediately above the transverse partition 5, and an observation-opening is also provided in the side of the post or pedestal at a point near the partition 5 and directly opposite the valve 7. Said observation-opening has a glass plate made gas-tight and is exteriorly closed by means of a removable screw cap or plug 9. This observation-opening is employed in order to enable the attendant to observe and to gain access to the valve 7, if occasion may require. From the foregoing it will be seen that the post or pedestal is divided by means of the transverse partition 5 into two chambers, the lower one of which for the purpose of this description I will term the "air-chamber" and the upper one of which I will term the "air and gas" or "mixing" conduit. Secured to the upper flanged end 2 of the post or pedestal is bolted an upright dish-shaped front plate 10, preferably circular in outline, said plate having an annular peripheral flange 12 for a purpose

presently to appear. The dish-shaped plate 10 is provided with an open tubular extension 13, projecting from its side wall, the outer end of said extension being flanged, as shown at 14, and this flange is bolted to the flange 2 at the top of the post or pedestal 1, as shown. A shell 15, having an annular flange 16, is bolted to the annular peripheral flange 12 on the dish-shaped front plate 10, an interposed gasket or packing-ring being employed, if necessary, in order to provide a fluid-tight joint between the elements.

With the parts constructed and arranged as above set forth it will be seen that a closed chamber is provided in the upper part of the apparatus, which for the sake of this description I will term a "receiving-chamber," said chamber having communication with the hollow post or pedestal through the tubular extension 13, whereby the mixture of air and gas from the post or pedestal may pass into said receiving-chamber and may also pass out of said chamber to the point of gas consumption through a pipe 17, fitted to an opening in the front plate 10, as more clearly shown in Fig. 1 of the drawings. The pipe 17 is extended within the shell 15 and receives its gas through perforations near its end.

Secured to the inner face of the front plate 10 and projecting within the receiving-chamber or within the shell 15 is a bracket 18, having two supports 19, provided with cup-shaped sockets or depressions 20 of hardened steel.

The reference-numeral 21 designates a cross arm or bar forming a part of a balance-frame, the other parts of said frame consisting of the side arms 22 22 and the counterbalance 23, extending between and joined to the ends of the side arms 22. The said arms 22 are provided with lateral extensions 24, in each of which is tapped a hardened-steel screw 25, the points of which when the balance-frame is in position for use are seated in the cup-shaped supports 19, as clearly shown in the drawings. Attached rigidly to the cross-arm 21 of the balance-frame is a hollow float 26, said float being of such weight that it will counterbalance with the weight 23 when the frame is supported upon the bracket 18. In order, however, to provide for a more accurate balance of the frame, (which latter will of course vary under service conditions of the apparatus, as will hereinafter appear,) I provide one of the side arms 22 with a projection 27, carrying a cup 28, which is arranged to receive small weights, as desired, in order to suitably balance the float according to the weight or density of the gas in the receiving-chamber. In Figs. 2 and 3 I have shown a very simple and convenient manner of applying the weights to the cup 28 in order to provide for the proper balance of the frame, said means consisting of the following elements:

A graduated dial-plate 29 is secured to the

front plate 10 of the apparatus, as shown, and passing centrally through said dial-plate and through the said front plate is a close-fitting shaft 30, said shaft having on its outer end a pointer 31, which coöperates with the dial-plate, and at its inner end the shaft is provided with a grooved pulley 34, over which passes a cord or chain 35, having at regular intervals thereon small weights 36, said pulley being so disposed that a portion of its periphery will lie directly over the cup 28, whereby as said pulley is rotated more or less of the cord or chain, with the weights thereon, will be taken up or let into the cup, as the case may be.

The outer end of the extension 27 is disposed directly above the valve 7 and is connected to said valve through the medium of a chain or rod 37, the latter passing up through the hollow post or pedestal 1, as will be seen, and it will be apparent, therefore, that any movement of the balance-frame will cause a like movement of the valve 7 to and from its seat, whereby the amount of air entering through the opening 6 into the mixing-chamber may be regulated.

The operation of the device is as follows: The balance-frame having the float rigidly connected therewith is so adjusted initially as that the valve 7, controlling the air-inlet, is closed and remains closed so long as gas of just the proper or desired degree of richness (or less) is passing through the apparatus to the point of consumption. As soon, however, as the gas becomes too highly charged or saturated the increase of its density or weight so resulting lifts that end of the balance-frame where the bulk of the float overhangs and with it the air-valve 7, at the same time correspondingly depressing the counterbalance 23. This movement of the float and its frame and with the latter the air-valve 7 admits air to the receiving-chamber through the valve-opening 6 to dilute the vapor in said chamber, and as the gas is being drawn from the receiving-chamber through the outlet-pipe 17 the float's action causes the position of the valve 7 to vary in accordance with the amount of air required from time to time. By means of the small weights 36, carried by the cord or chain 35, the balance-frame, together with the valve 7, may be adjusted as desired to control the admission of air, depending upon the character or density of the gas, thus keeping the vapor within the receiving-chamber at practically a constant density and insuring a gas of even and regular quality at the point of consumption.

It will be seen from the foregoing that the apparatus herein shown and described may be easily and quickly adjusted and that an inspection of the pointer and dial will enable a person to determine at once through observation the character of the gas passing through the delivery-pipe, the dial being provided with

suitable characters or marks designating different qualities of gas.

We do not wish to be understood as limiting ourselves to the precise construction and arrangement of means for applying the additional weights to the balance-frame to poise the latter, as various changes may be made to this part of the apparatus without departing from the spirit of the invention as defined in the appended claims. For instance, we may employ the construction shown in Fig. 7 of the drawings, in which a rod 38, carrying the chain with attached weights, is passed through a stuffing-box 39 in an extension on the top of the shell 15, the said chain being disposed so as to deliver the weights into a cup 40, secured directly to the float, or instead of this arrangement we could employ that shown in Fig. 8, wherein the chain with attached weights is connected at one end to the stem of the valve 7 and a cup 41 is mounted upon a rod 42, which passes through a stuffing-box in the bottom of the post or pedestal. By adjusting the position of the rod in either of the constructions as shown in Figs. 7 and 8 it will be apparent that more or less of the weights may be taken up by the cups and the frame thus brought to proper balance. Obviously, the various forms of chain and weight adjusting means herein shown may be applied to other parts of the balance-frame than those herein shown.

An important feature of the invention resides in the fact that the balance-frame and all parts associated therewith are supported from the bracket that is carried by the front plate. This is of considerable advantage, for the reason that access can be gained to these parts at any time by simply removing the shell 15 from the front plate, which can be accomplished by loosening the bolts that connect these parts.

Another important feature of the invention resides in the fact that the float is rigidly connected to the balance-frame, no flexible joints or connections between these parts being present, this avoiding any looseness or lost motion between the parts.

A further feature resides in the particular manner of supporting the balance-frame, which is accomplished by means of the pointed pins or screws which are seated in the cupped bearings. Thus friction between the parts is reduced to a minimum and a free poising action of the frame secured.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an apparatus for regulating the quality of gas, a receiving-chamber, a gas-inlet and an air-inlet, both having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, a balance-frame carrying a float, a connection between said frame and valve, a plu-

rality of flexibly-connected weights located within the chamber and cooperating with the balance-frame to poise the latter, and means located outside the chamber for controlling the action of said weights on the frame.

2. In an apparatus for regulating the quality of gas, a receiving-chamber, a gas-inlet and an air-inlet, both having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, a balance-frame carrying a float, a connection between said frame and valve, a plurality of flexibly-connected weights located within the chamber and cooperating with the balance-frame to poise the latter, means located outside the chamber for controlling the action of said weights on the frame, and a scale cooperating with said means.

3. In an apparatus for regulating the quality of gas, a receiving-chamber, a gas-inlet and an air-inlet, both having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, a balance-frame carrying a float, a connection between said frame and valve, a flexible element carrying a plurality of weights located within the chamber and cooperating with the balance-frame to poise the latter, and means located outside the chamber for controlling the position of said weights relatively to the frame.

4. In an apparatus for regulating the quality of gas, a receiving-chamber, a gas and air inlet having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, a balance-frame carrying a float, a connection between said frame and valve, a support having a portion extending within and a portion projecting without the chamber, and a flexible element carrying a plurality of weights connected to that part of the support within the chamber.

5. In an apparatus for regulating the quality of gas, a receiving-chamber, a gas and air inlet having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, a balance-frame carrying a float, a connection between said frame and valve, a support having a portion extending within and a portion projecting without the chamber, a flexible element carrying a plurality of weights connected to that part of the support within the chamber, and a scale cooperating with that portion of the support projecting outside the chamber.

6. In an apparatus of the class described, a hollow post or pedestal having air and gas inlets, a valve controlling the air-inlet, a head secured to the upper end of the post or pedestal and having communication therewith, a gas-outlet leading from the head, a frame poised within the head and carrying a float, and a connection between the frame and valve.

7. In an apparatus of the class described, a hollow post or pedestal, having separate air and gas inlets, a valve for controlling the air-inlet, a head secured to the upper end of the post and communicating therewith, a gas-outlet leading from the head, a frame poised within the head and carrying a float, a connection between the frame and valve, and a plurality of weights suspended within the head and coöperating with the balance-frame to poise the latter.

8. In an apparatus of the class described, a hollow post or pedestal having separate air and gas inlets, a valve for controlling the air-inlet, a front plate having a tubular portion secured to the upper end of the post, a shell secured to said front plate and forming therewith a gas-chamber, a gas-outlet leading from said chamber, a frame poised within the chamber and carrying a float, and a connection between the frame and valve.

9. In an apparatus of the class described, a hollow post or pedestal having air and gas inlets, a valve controlling the air-inlet, a head secured to the upper end of the post or pedestal and having communication therewith, a gas-outlet leading from the head, a balance-frame located within the head and carrying a float, a connection between the frame and valve, and means operable from without the head for poising the balance-frame.

10. In an apparatus of the character described, a hollow post or pedestal, having air and gas inlets, a valve for controlling the air-inlet, a front plate having a tubular portion secured to the upper end of the post, a shell removably attached to said front plate and forming therewith a gas-chamber, a gas-outlet leading from said chamber, a bracket secured to said front plate and extending within the chamber, cup-bearings carried by the bracket, a balance-frame having pointed bearings seated in the said cup-bearings, a float carried by said frame and a connection between the frame and valve.

11. In a device for regulating the quality of gas, a receiving-chamber, a gas-inlet and an air-inlet, both having communication with said chamber, and a gas-outlet leading from the chamber, a valve for controlling the flow of air, cup-bearings located within the chamber, a balance-frame having adjustable pointed

bearings seated within the said cup-bearings, a float rigidly attached to the balance-frame, and a connection between the frame and valve.

12. In an apparatus of the character described, a hollow post or pedestal having air and gas inlets, and an observation-opening, a closure for said opening, a valve for controlling the air-inlet, a head secured to the upper end of the post or pedestal, and having communication therewith, a gas-outlet leading from the head, a frame poised within the head and carrying a float and a connection between the frame and valve.

13. In an apparatus of the character described, a hollow post having air and gas inlets, a valve for controlling the air-inlet, a head secured to the upper end of the post and having communication therewith, a gas-outlet leading from the head, a balance-frame located within the head, a float rigidly attached to said frame, a connection between the frame and valve, and means for poising the balance-frame.

14. In an apparatus of the character described, a hollow post or pedestal having air and gas inlets and an observation-opening located opposite said air-inlet, a transparent closure for said opening, a valve for controlling the air-inlet, a head secured to the upper end of the post or pedestal and having communication therewith, a gas-outlet leading from the head, a float poised within the head, and a connection between the float and valve.

15. In an apparatus for regulating the quality of gas, a receiving-chamber having a gas and air inlet and a gas-outlet, a valve for controlling the air-inlet, a poised float within the chamber, means actuated by the movements of the float for controlling the position of said valve, and a plurality of flexibly-connected weights to variably poise the float according to the specific gravity of the gas within the receiving-chamber.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

CLARENCE M. KEMP.
CHARLES E. KEMP.

Witnesses:

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