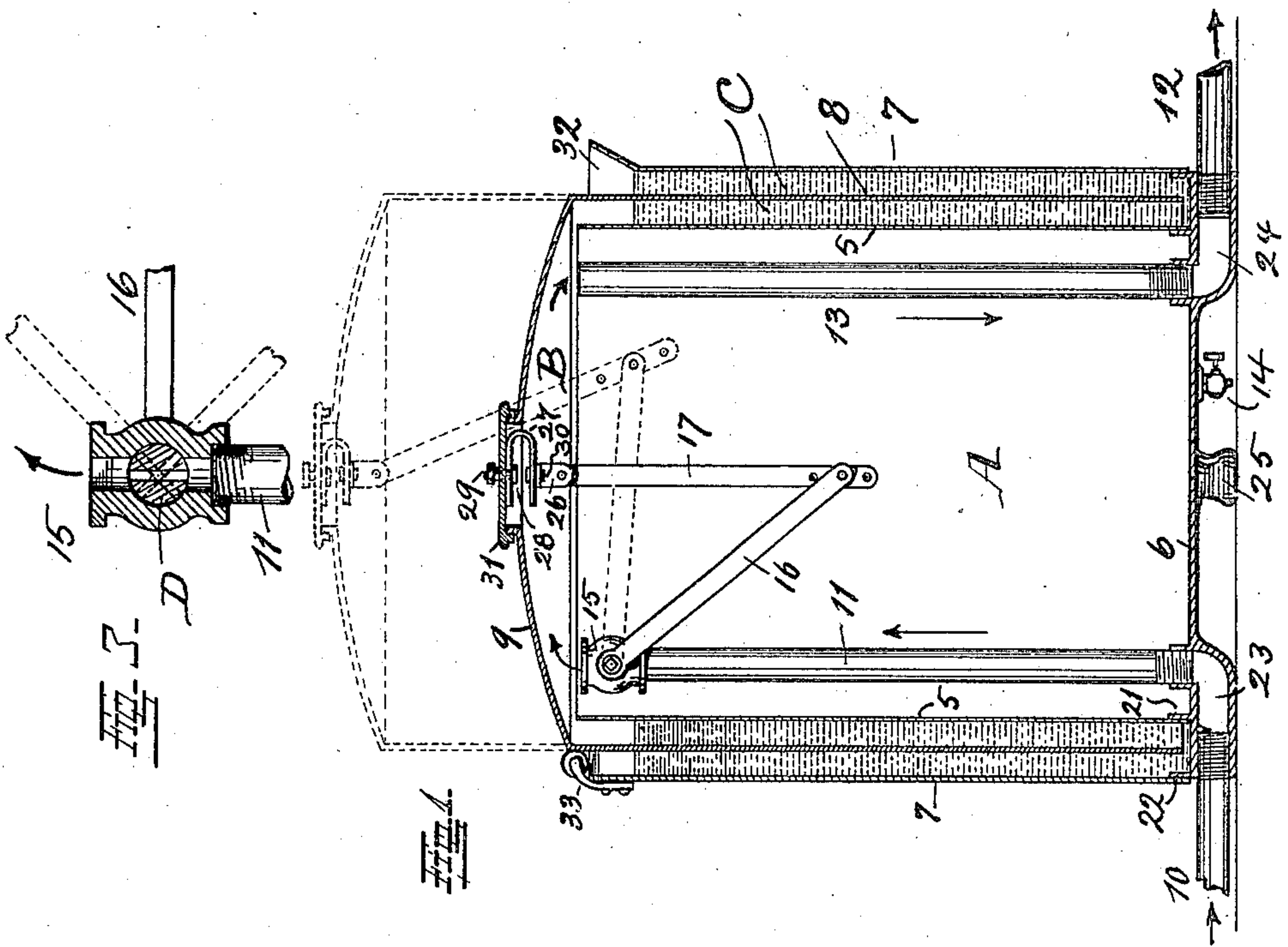


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Inventor:  
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by C. Spengel Atty



# UNITED STATES PATENT OFFICE.

HERBERT OGLVIE EWING, OF MIDDLEPORT, OHIO.

GAS-SUPPLY-CONTROLLING DEVICE.

948,724.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed April 29, 1908. Serial No. 429,888.

*To all whom it may concern:*

Be it known that I, HERBERT O. EWING, a citizen of the United States, and residing at Middleport, Meigs county, State of Ohio, have invented a certain new and useful Gas-Supply-Controlling Device; and I do declare the following to be a clear, full, and exact description of the invention, attention being called to the accompanying drawing, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to new and useful devices to control and to regulate the supply of gas, natural or artificial, while the same is used for illuminating, heating or power-generating purposes.

Addition of air to the gas and mixing of both is not contemplated by this device.

The invention consists of the various means and devices, also of their construction and relative arrangement all as hereinafter described and claimed and as shown in the accompanying drawing which shows the device with its operative parts in various positions.

Figure 1, is a vertical cross-section and Fig. 2, a similar view partly in elevation. Fig. 3, is an enlarged section through a valve used in connection with the device.

The device consists primarily of a gas-holder which comprises two communicating chambers or spaces viz. a space or chamber A of permanent shape and capacity and a space or chamber B of varying capacity. The first chamber is formed by an inclosure of which 5 is the wall and 6 the bottom, the two forming substantially a cylindrical vessel open at its top. The bottom extends beyond the lower edge of wall 5 and at its outer edge supports another wall 7, spaced from wall 5 first mentioned, and concentric therewith. The space between these two walls constitutes an annular chamber or pocket C, which is filled with a suitable liquid not readily susceptible to freezing like oil, or glycerin, for instance. Chamber B is also formed by an inclosure of a shape similar to chamber A and occupies an inverted position, with its side-wall 8 within pocket C and between walls 5 and 7 thereof. It constitutes substantially a gasometer sealed by the liquid in pocket C, and with its top 9 above chamber A. The gas-supply enters through a pipe 10 and by means of an upright pipe 11 is directed to discharge into

the gas-holder at the upper open end of chamber A, the discharge-end of this pipe being substantially at even height with the upper edge of pocket C around said chamber.

12 is the service pipe which conveys the gas either directly, or by intermediate pipelines, to the various points of its consumption which may be light-burners, heaters, cooking-devices, gas-engines, etc. This pipe communicates with the gas-holder by another upright pipe 13 which takes the gas also at the upper end of chamber A, the upper end of this pipe being substantially in line with the upper edge of pocket C and with the upper end of pipe 11, so that the gas enters and leaves the gas-holder on a level with said pocket. The practical effect of this arrangement is that any foreign matter or moisture carried in by the gas is given a chance to separate therefrom while passing from the upper end of pipe 11, across chamber A to the upper end of pipe 13, said chamber acting as a trap which intercepts such matter. An outlet controlled by a suitable device, plug, cap, or cock 14 is provided in bottom 6 of chamber A which permits any accumulated matter to be removed.

The gas-supply is automatically regulated and controlled by the movements of upper chamber B, the capacity of which varies according to the rate at which gas is taken by the service or line-pipe. When no gas is consumed at all and none discharges through pipe 12, it becomes obviously necessary to cut off the supply to the gas-holder, because otherwise, as soon as the capacity of the upper chamber B is exhausted by the rising of bell B, the gas would force itself out around the lower edge of the holder and escape through pocket C. For such purpose a valve 15 is mounted at the extreme upper end of inlet pipe 11 and provided with an arm 16 rigidly mounted upon the outer end of the ported cock D of this valve. A link 17 is connected at one of its ends to the free end of this arm and at its other end to the inside of the top of the bell. Cock D, which is fitted to rotate within its housing, is so set therein that when the bell is in the position shown in Fig. 2, it closes valve 15 absolutely and no gas can enter the gas-holder. As soon as gas is taken by the service pipe, bell B sinks and causes valve 15 to open so that pipe 11 may supply gas commensurate to consumption.

While the gasometer is in operation it



fluctuates and ordinarily it is presumed to occupy a position approximately indicated in dotted lines in Fig. 1. The full lines in this figure illustrate the lowest position of the bell.

This gas-holder when used in connection with gas-engines will prevent disturbance of other devices on the same line, because by reason of its capacity, fluctuations of the bell will immediately equalize and balance the pulsations of the engines. When so used it is preferable to so adjust the position of cock D of valve 15, after it is connected to arm 16 whereby it is actuated, with reference to the ports in the housing of said valve, that when on reduced supply and low pressure the bell sinks, the supply is not entirely cut off, permitting the service-pipe 12 to take gas direct from the general supply-pipe without being at this time subjected to any regulating control. The unexpected and not-prepared-for stoppage of engines in operation is thus prevented. In view of these facts, gas bags now interposed on feed-lines to engines may be dispensed with, thus removing an objection connected with their use, viz: the cutting off of the gas-supply by collapse of the bags when reduced gas-supply is incapable of compensating for the suction from the engines. Again when under these conditions heavy draft on the service-pipe should cause any of the sealing liquid to be sucked out of pocket C, such liquid cannot enter the service pipe but falls to the bottom of chamber A, from where it may be drained out by cock 14.

It will now be seen that the gas-supply is under perfect control and all danger of escape of gas due to excess of supply over consumption is eliminated. Thus for instance in case consumption should entirely and unexpectedly cease and no gas be taken through the service-pipe, no disturbance of any kind results, because the rising bell will close the outlet of pipe 11 automatically, even if the supply entering through pipe 10 is not cut off.

Should valve 15, by reason of any defect, become leaky, the escaping gas is still confined in the gas-holder and merely forms a part of the supply passing out with the other gas through the service-pipe. It is not wasted, nor does it become a source of danger by vitiating the surrounding air, or by creating possibility of explosion. Such leakage may however become so extensive that the fluctuations of the bell whereby the same controls and regulates the supply according to rate of use, cannot overcome the additional gas thus passing into the holder. In such case bell B rises not merely to the position shown in Fig. 2, in which it closes valve 15, but obviously it continues rising beyond this position, since gas a leaky valve being presumed continues to flow into the

holder. The limit of the rise of the bell whereby the receiving capacity of the gas-holder becomes exhausted, is indicated in dotted lines in Fig. 2 and is reached when the bell has pulled arm 16 and link 17 into a position where both are in a straight line. Cock D, being free to rotate in the valve-housing, does not interfere with this additional movement. Such a condition requires of course immediate attention and since the parts involved cannot be seen, it becomes necessary to provide means whereby conditions and action of the gas-holder are ascertainable. For such purpose I provide on the outside of the bell a mark or line as shown at 18. The appearance of this line above the upper edge of the pocket, due to this additional movement of the bell after valve 15 is closed, would thus be a warning signal, calling attention to the abnormal action of the device and indicating the necessity of prompt and appropriate attendance. The word "leaking" may be applied opposite this line. There may also be applied an additional line 19, marked "full", above the line first mentioned. The appearance of this line, which comes to view before the other line, and shows when the bell is in a position as shown in Fig. 2 and below the position in dotted lines, while not indicating an objectionable condition, nevertheless serves as a preparatory signal since it appears before the other line and thereby invites the attention of the operator. The aforesaid description presumes the use of the gasometer on lines from which also gas-engines are fed and where the gas is cut off only at the high position of bell B.

When used for domestic purposes exclusively like lighting, heating and cooking, the device is arranged so that the gas is also cut off when bell B is in its lowest position as shown in Fig. 1. This is done by adjusting the relative position of cock D within its valve-housing and its connection to arm 16 accordingly. Observe also Fig. 3. In this case discharge-valve 15 is open only when the bell is in its intermediate position as shown in dotted lines in Fig. 1, the cock being then in a position as shown in Fig. 3. Here the cock closes the outlet not only when the gasometer is full and the bell approaches its highest position as before described and as shown in Fig. 2, but it also closes when the gasometer is empty and the bell approaches and occupies its lowest position as shown in Fig. 1. Note also dotted lines in Fig. 3. The device becomes thus an automatic cut-off in cases where gas has ceased to flow through supply-pipe 10 for any reason, or is unexpectedly cut off without notice to consumers. In such case burning lights will become extinguished as soon as the supply in the gasometer is exhausted and if this occurs unnoticed, as for instance



during the night or in the absence of users, the particular burners will remain open after the lights are extinguished. Should thereafter gas start to flow again, it is obvious that it would escape through burners thus left open and thereby endanger life and property. The fact however that valve 15 closes also when the bell is empty and in its lowest position excludes this possibility, because the valve is now not only closed, but it is also absolutely beyond the automatic control of the bell. Nor is it possible for the bell to recover this control automatically as it may do in the first case and the gasometer cannot resume operation until the bell is manually raised to open the cock and to admit gas sufficient to raise the bell and to sustain it in the raised position. This however causes obviously previous inspection to ascertain condition of the burners and leads to a closing of such which are left open. The function of a safety appliance is thus added to the device.

As to the practical construction of the gas-holder, it may be said in general that the same is carried out in a manner customary in such devices. The various walls are made of sheet-metal. Bottom 6 may be cast-metal, with flanges 21 and 22 on its upper side serving for connection, respectively of walls 5 and 7, the lower edges of which are riveted to these flanges. Nipples 23 and 24 are provided on its underside for reception of pipes 10 and 12 respectively, these nipples being located diametrically opposite each other. Feet 25, also diametrically opposite each other, are provided intermediate these nipples upon which, in conjunction with these latter, the bottom rests.

Cock D is free to rotate within the housing of valve 15 in either direction and does not impede the movement of the bell by reason of its connection thereto, and this latter may freely move in either direction with pocket C from the bottom of the same to a position near the upper end thereof.

A hinge 26 connects one end of link 17 to top 9 of the bell, the connection being to a bracket 27, which by means of a bolt 28 and a nut 29 is held to a cap 31 seated on top of the bell. This cap permits access and facilitates connection. The connection of hinge 26 to bracket 27 is not a rigid one, but by means of a pin 30 in a manner to form a swivel-joint, which in case the bell should swing or move unevenly, prevents straining of the valve-connections.

Nut 29 or cap 31 may serve to manipulate the bell when the same is to be manually raised as before described.

A funnel 32 facilitates filling of pocket C. 33 are guide-rollers which hold the bell to a straight movement during its fluctuations in pocket C.

It will now be seen that with few parts

and by a simple construction, an efficient and safe device is produced which at once performs the function of a gas-holder, and of a gas-supply controlling and regulating device, and also acts as an automatic safety cut-off under conditions named.

Having described my invention, I claim as new:

1. In a gas-regulating and controlling device, the combination of a gas-holder comprising a lower, and an inverted upper vessel which latter is adjustable with reference to the lower vessel, a gas-supply pipe terminating within the gas-holder, a gas-discharge pipe in communication therewith, a valve controlling the supply-pipe and located within the gas-holder and means connected to the inside of the adjustable vessel of the gas-holder and adapted to actuate this valve in a manner that the same is closed in both the high and the low positions of the adjustable vessel.

2. In a gas-regulating and controlling device, the combination of a gas-holder comprising a lower vessel having an annular pocket and an inverted imperforate upper vessel which latter occupies said pocket and is adjustable with reference to the lower vessel, both vessels being of approximately even height, a gas-supply pipe terminating within the pocketed vessel of the gas-holder, a gas-discharge pipe in communication therewith, a valve controlling the supply-pipe and located within the pocketed vessel of the gas-holder, an arm adapted to operate this valve and a link permanently connecting at one of its ends to this arm and at its other end to the adjustable vessel of the gas-holder and within this latter.

3. In a gas-regulating and controlling device, the combination of a gas-holder comprising a lower, and an inverted upper vessel which latter is adjustable with reference to the lower vessel, a gas-supply pipe terminating within the gas-holder, a gas-discharge pipe in communication therewith, a valve controlling this supply-pipe and located within the gas-holder, an arm adapted to operate this valve and a link permanently connecting it to the adjustable vessel of the gas-holder and at the underside of the top of said vessel, valve and length of arm and of link being so arranged as to permit a further limited upward movement of the adjustable vessel after the valve controlling the supply-pipe is closed.

4. In a gas-regulating and controlling device, the combination of a gas-holder comprising a lower, and an inverted upper vessel which latter is adjustable with reference to the lower vessel, both vessels being of approximately the same height, a gas-supply pipe terminating within the lower vessel, a gas-discharge pipe in communication therewith, a valve controlling the supply-pipe

and located within the lower vessel, an arm adapted to operate this valve, a link permanently connected at one of its ends to this arm, a hinge at the other end of the  
5 link and a swivel-joint whereby the hinge is connected to the inside of the adjustable vessel.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HERBERT OGLVIE EWING.

Witnesses:

IRA GRAHAM,  
THOS. F. CRARY.