Aug. 16, 1927. 1,639,394

E. P. G. WÜNSCH

RETORT AND GAS FLOW REGULATING APPARATUS

Filed April 10, 1925

Fig. 1.

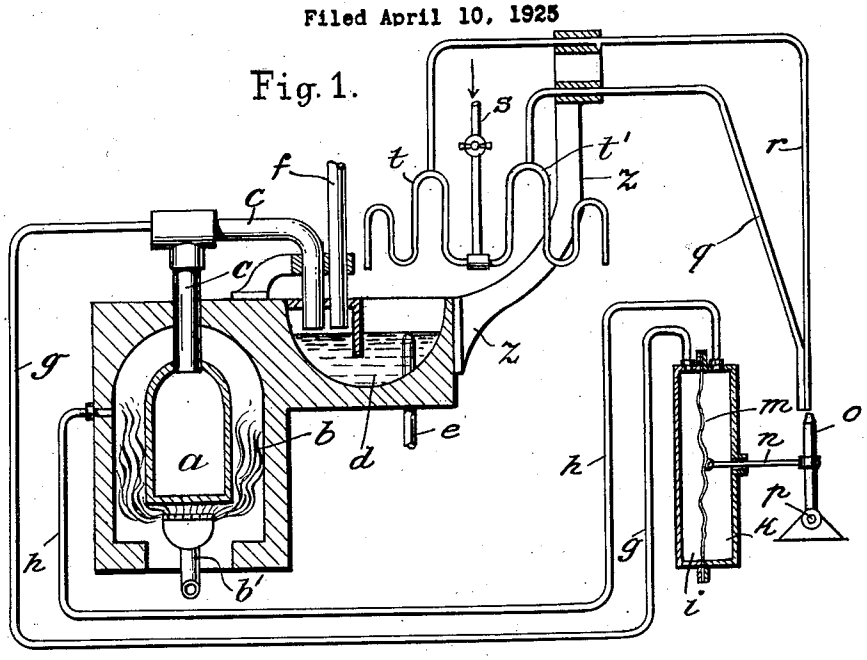
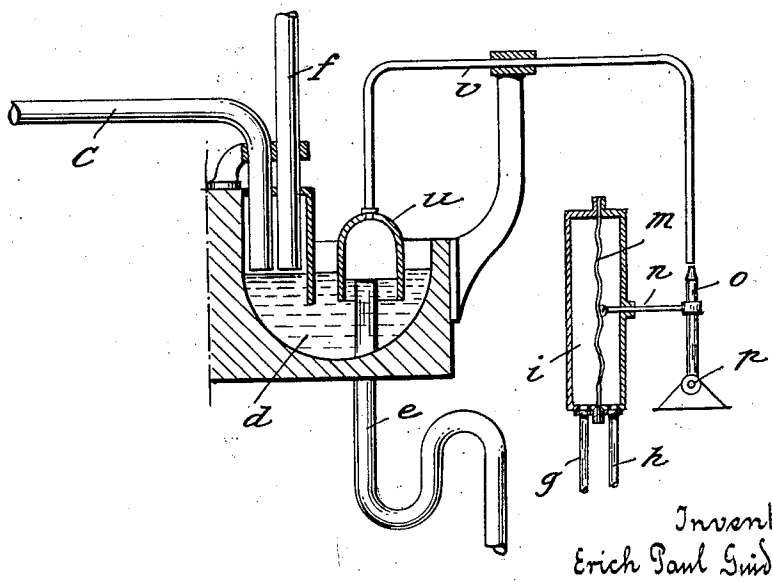


Fig. 2.



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by [illegible] attorney

Patented Aug. 16, 1927. 1,639,394

UNITED STATES PATENT OFFICE.

ERICH PAUL GUIDO WÜNSCH, OF STEGLITZ, NEAR BERLIN, GERMANY, ASSIGNOR TO ASKANIA-WERKE AKTIENGESELLSCHAFT VORMALS CENTRALWERKSTATT DESSAU UND CARL BAMBERG-FRIEDENAU, OF BERLIN-FRIEDENAU, GERMANY.

RETORT AND GAS-FLOW REGULATING APPARATUS.

Application filed April 10, 1925, Serial No. 22,122, and in Germany April 26, 1924.

It has already been proposed to regulate the drawing off of the gases from retorts and coke ovens in this way that sucking off the gas is made dependent upon the pressure of the atmosphere, and adjusted correspondingly; or the sucking off of the gas is adjusted with the intermediary of a differential pressure regulating device which is so adjusted that the pressure existing in the retort is equal to the pressure existing in the flues. With plants of the latter kind a differential pressure regulating device intended to act when gas is being sucked off is necessary for every individual retort.

The present invention relates to an arrangement and combination of parts by which it is rendered possible to effect the regulation with the simplest means and independently without the employment of any part requiring watching or attending.

My invention is illustrated diagrammatically and by way of example in the accompanying drawing in which—

Figure 1 is a vertical elevation of one constructional form of the invention with parts in section and

Figure 2 a similar elevation of a modification thereof.

Referring to Figure 1, *a* denotes the gas generating retort which is enclosed in the heating furnace *b* heated by a burner b^1. The gas generated flows through a pipe *c* into a hydraulic main or wash box *d* filled in a known manner with water and assisting in the purification of the gas. *e* denotes an overflow-pipe, and *f* a pipe serving to conduct away the purified gas, and forming part of the apparatus for drawing of the gas off by suction.

The resistance which the hydraulic main or wash box *d* presents the gas passing through it varies according to how much the lower ends of the gas delivery pipes are remote from the level of the liquid contained in the hydraulic main. This fact is utilized in my invention for the regulation of the drawing off of the gas, in that, if the suction remains constant, the amount sucked off will be different according to the resistance in the pipe.

In the constructional form illustrated by way of example in Fig. 1 the regulation is adjusted in conformity with the difference between the pressure existing in the retort and that existing in the heating flue or flues. For this purpose two pipes *g* and *h* extend respectively from the pipe *c* and from the heating furnace *b* and terminate at chambers *i* and *k* which are separated from one another by a diaphragm *m*. The diaphragm is movably connected with a swinging tube *o* provided with a nozzle at its free end communicating at *p* with a pipe through which it is supplied constantly with compressed air or another compressed gas.

Pipes *q* and *r* supported by a bracket *z* terminate opposite the nozzle of the tube *o*.

The water with which the hydraulic main or wash box is to be filled is supplied through the pipe *s*, to the lower end of which are attached two undulated pipes *t* and *t'*; the highest points of these pipes are connected with the pipes *q* and *r*.

The manner of operation of this device is as follows:

Water is supplied continuously through the pipe *s* into the undulated pipes *t* and *t'* one half of the amount flowing into receiver, the other half flowing away to any place whatever, if both undulated pipes present equal resistances.

If the ratio between the pressure of the gas present in the gas generating retort *a* and the gas present in the heating furnace *b*, changes, the same difference of pressure will arise in the chambers *i* and *k*, or on the two sides of the diaphragm *m* respectively, in consequence whereof the tube *o* will be turned a little to one or the other side. If the pressure existing in the gas generating retort has become too high, the rod *n* will be moved to the right, the increase of that pressure being transmitted to the chamber *i* by means of the pipe *g*. The position of the tube *o* will then be that shown in Fig. 1 in which the nozzle of said tube stands opposite the end of the pipe *r*, in consequence whereof the pressure in the undulated pipe *t* will become greater than that existing in the undulated tube *t'*. Owing to that increase of pressure in the pipe *t* the flow of the water through it will be interrupted in that said pressure counteracts the water, causing it to flow away solely through the undulated pipe *t'*. The opening of the overflow pipe *e* is of such dimension that the

water flowing normally from the pipe t into the receiver d may flow out, if however according to the action of the pressure regulator the flow of the water is interrupted in the pipe t' so that the water flows solely through the pipe t a greater quantity of water flows into the receiver from the pipe t than may flow out through the overflow pipe e so that the level of the water rises. As a consequence of the increase of pressure in the pipe t the level of the water in the basin d of the receiver falls so that a larger amount of gas can and will pass from the pipe c into the pipe f until equalization between the pressures in the chamber a and in the furnace b has taken place.

If, reversely, the pressure in the furnace b becomes too high, the tube o will be so adjusted that its nozzle stands opposite the pipe q when the reverse of what has been described in the preceding paragraph will take place, that is to say, the water coming from the pipe s will flow solely into the basin d so that its level will rise to a certain maximum height as determined by the overflow pipe e. The resistance which the gas must overcome to flow from the pipe c into the pipe f is then increased correspondingly, and a smaller amount of gas passes from c to f until again equalization has taken place.

In the modification shown in Figure 2, the upper end of the overflow pipe e is covered with a bell u connected with a pipe v which terminates just above the swinging tube o. The other members of the arrangement and combination of parts are the same as in Fig. 1.

The manner of operation of this modification is as follows:

According as the pressure in the regulator chambers rises or falls, the tube o will be swung to one or the other side or will stand vertically, and the amount of compressed air or compressed gas flowing forth from the nozzle of the tube o into the pipe v or into the atmosphere will vary correspondingly, as does, consequently also the pressure existing in the bell u. The level of the water in the bell will rise or fall correspondingly, and the level of the water outside the bell will fall or rise correspondingly, whereby the resistance which the gas must overcome when flowing from the pipe c into the pipe f will be correspondingly varied.

If the tube o is in the position shown in Fig. 2, the pressure in the bell u will be increased, the level of the water in the bell will fall and the level of the water outside the bell will rise so that less gas will flow from the tube c to the tube f. Reversely, if the nozzle of the tube o does not stand just opposite the end of the pipe v the level of the water in the bell will be the same as that outside the bell, the resistance to the gas being then obviously less.

It is, with this constructional form, possible to close the hydraulic main d and to provide a pipe extending from the closing plate or other covering or lid and terminating just above the swinging tube o, whereby it is rendered possible to increase the pressure outside the bell beyond that inside it, so that a larger range of action is obtained. Another possibility is to connect the bell with the atmosphere and to regulate solely the pressure existing below said cover or lid of the hydraulic main.

I claim:

1. A gas flow regulating apparatus having in combination, a gas retort, a heating furnace for the gas retort, a liquid seal wash box, a regulator controlled by the pressure of the gas in the retort, liquid admission means to the liquid seal of the wash box, a regulating device controlled by said regulator and controlling said liquid admission means, the gas flow being controlled by the height of the liquid seal in the wash box.

2. A gas flow regulating apparatus having in combination, a gas retort, a heating furnace for the gas retort, a liquid seal wash box, a regulator controlled by the pressure of the gas in the retort, liquid admission means to the liquid seal of the wash box, a compressed gas tube controlled by said regulator and controlling said liquid admission means, the gas flow being controlled by the height of the liquid seal in the wash box.

3. A gas flow regulating apparatus having in combination, a gas retort, a heating furnace for the gas retort, a liquid seal wash box, a diaphragm regulator having gas chambers, separate gas conduits from the retort and the furnace to the gas chambers, a compressed gas tube controlled by the diaphragm regulator, liquid admission means to the liquid seal of the wash box, said liquid admission means being controlled by the compressed gas tube, and the gas flow being controlled by the height of the liquid seal in the wash box.

In testimony whereof I have affixed my signature.

GUIDO WÜNSCH.