No. 654,238. Patented July 24, 1900.

A. H. ELLIOTT.

AUTOMATIC GAS REGULATOR.

(Application filed Sept. 7, 1898.)

(No Model.)

Fig. 1.

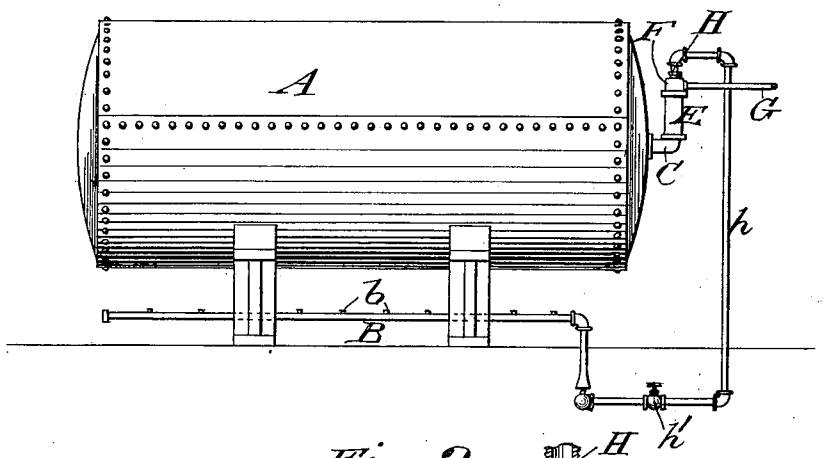
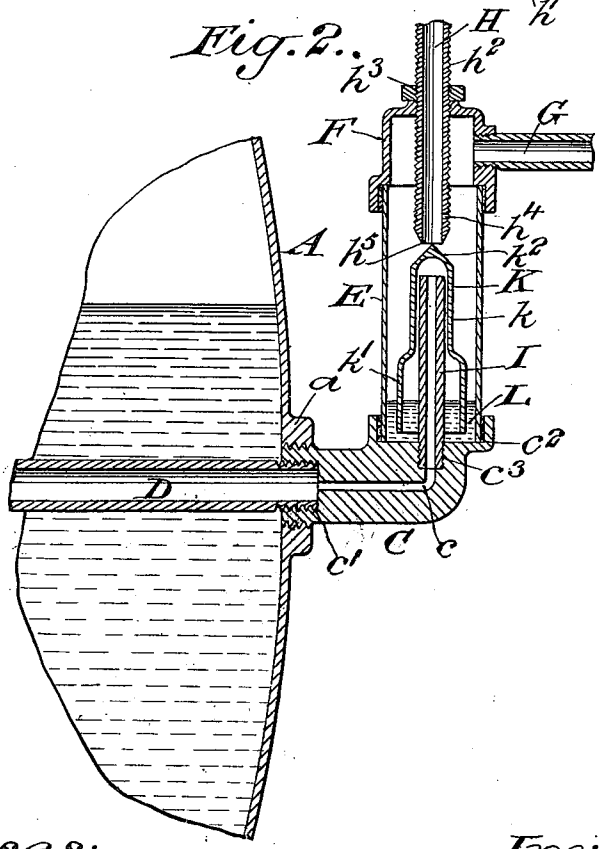


Fig. 2.



Witnesses:-
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UNITED STATES PATENT OFFICE.

ARTHUR H. ELLIOTT, OF NEW ROCHELLE, NEW YORK.

AUTOMATIC GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 654,238, dated July 24, 1900.

Application filed September 7, 1898. Serial No. 690,421. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. ELLIOTT, a citizen of the United States, and a resident of New Rochelle, in the county of Westchester and State of New York, have invented a new and useful Automatic Gas-Regulator, of which the following is a specification.

My invention relates to an automatic gas-regulator, and more particularly to a gas-regulator for use in connection with a hot-water boiler, with the object in view of providing a simple and effective means for maintaining the water in the boiler at a predetermined temperature by furnishing more or less fuel to the heating-flames.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 shows in side elevation a boiler with the regulator attached thereto as it appears in use, and Fig. 2 is an enlarged vertical section through the regulator and a portion of the boiler adjacent thereto.

The boiler, here shown as a horizontal boiler of elongated cylindrical form, is denoted by A. Underneath it there is located a pipe B, provided with nipples *b* for directing the gas-jets toward the under side of the boiler A to heat the water therein.

At the end of the boiler, and preferably at a point about centrally of the end, there is an interiorly-screw-threaded hub *a*, in which there is screwed a short tube C, which is intended to form a support for the gas-regulator and through which there is a passage *c*, communicating with an air-tube D, intended to remain within the body of water within the boiler A. The air-tube D is conveniently secured to the supporting-tube C by screwing its open end into an interiorly-screw-threaded socket *c'*, formed in the inner end of the tube C. The opposite end of the air-tube D is closed. The outer end of the supporting-tube C is provided with an upwardly-directed socket c^2, in which is fixed air-tight a short vertical tube E, preferably of some suitable transparent material, as glass. The upper end of the tube E is fixed air-tight in the lower end of a hollow cap-piece F, into which the gas is fed by means of a pipe G from a suitable source of supply (Not shown.) Through the top of the cap-piece F the discharge-pipe H leads, by means of a connecting-pipe *h*, to the burner B.

The pipe *h* intermediate of the burner and the regulator is provided with a suitable cut-off cock *h'* of any well-known or approved form. The discharge-pipe H is provided with an exterior screw-thread h^2, by means of which it is screwed into the top of the cap-piece F to adjust its end within the tube E upwardly and downwardly, as may be desired. A locking-nut h^3 serves to hold the discharge-pipe H in the desired adjustment, and a small perforation h^4 through the side wall of the pipe H within the tube or casing E admits at all times a limited supply of gas to the burner, sufficient to keep a small flame burning at each of the jets.

Within the tube or casing E, preferably about centrally therein, there is fixed an upwardly-projecting tube I, forming a continuation of the passage *c* through the supporting-tube C. The tube I is conveniently screwed at its lower end into a socket c^3, formed in the outer end of the supporting-tube C, and completely closes the interior of the casing E from the passage C through the supporting-tube C, except through the upper end of the tube I.

The tube I, while forming a communication between the air-tube D within the boiler and the interior of the casing E, also forms a guide for the vertically-reciprocating movement of the valve K.

The valve K is closed at its upper end and open at its lower end and floats in a body of liquid L—mercury, for example—placed in the bottom of the tube or casing E around the guide-tube I. I prefer to make the valve K with a contracted upper portion *k* to loosely embrace the guide-tube I, but not so closely as to prevent a free passage of air between the inner wall of the valve and the exterior wall of the tube I, and a lower enlarged portion *k'*, resting in the body of liquid L. The top of the floating valve K is made conical, as shown at k^2, and is intended to enter the lower open end of the discharge-tube H, which end is reduced to a sharp edge, as shown at h^5, in order to prevent any tendency of the two parts to cling together by frictional contact or by the adhesion of any glutinous product of the gaseous fluid.

In operation the expanded air within the

air-tube D, due to the increase of temperature of the water within the boiler, gradually lifts the float-valve K to its seat, and when the water has reached the temperature determined upon the gas will be shut off from entering the open end of the tube H and the flames will be reduced to a size dependent upon the supply of gas obtained through the small opening h^4 in the side of the tube H.

The tube H may be adjusted toward and away from the end of the valve, so as to cause it to close at an earlier or later stage in the heating of the water within the tank, and the parts are so housed and so simple in their operation that they require practically no attention for long periods of time.

What I claim is—

The combination with a vessel for containing a fluid to be heated, of a tubular supporting-piece fixed to the vessel-wall, an air-reservoir extending from the said supporting-piece into the interior of the vessel, an upright casing fixed liquid-tight to the exterior of the supporting-piece, an upright pipe fixed to the outer end of the supporting-piece within the upright casing and forming an extension of the passage-way through the supporting-piece, a hollow valve closed at its upper end and open at its lower end and surrounding the upright pipe within the casing, a body of liquid located in the bottom of the casing around the upright pipe and forming a seal between the interior of the valve and the interior of the casing, a pipe for admitting gas to the interior of the casing, a vertically-adjustable gas-exit pipe extending into the interior of the casing toward the closed end of said hollow valve and a burner in position to supply heat to said vessel and connected with said gas-exit pipe, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of August, 1898.

ARTHUR H. ELLIOTT.

Witnesses:

FREDK. HAYNES,

GEORGE BARRY, Jr.