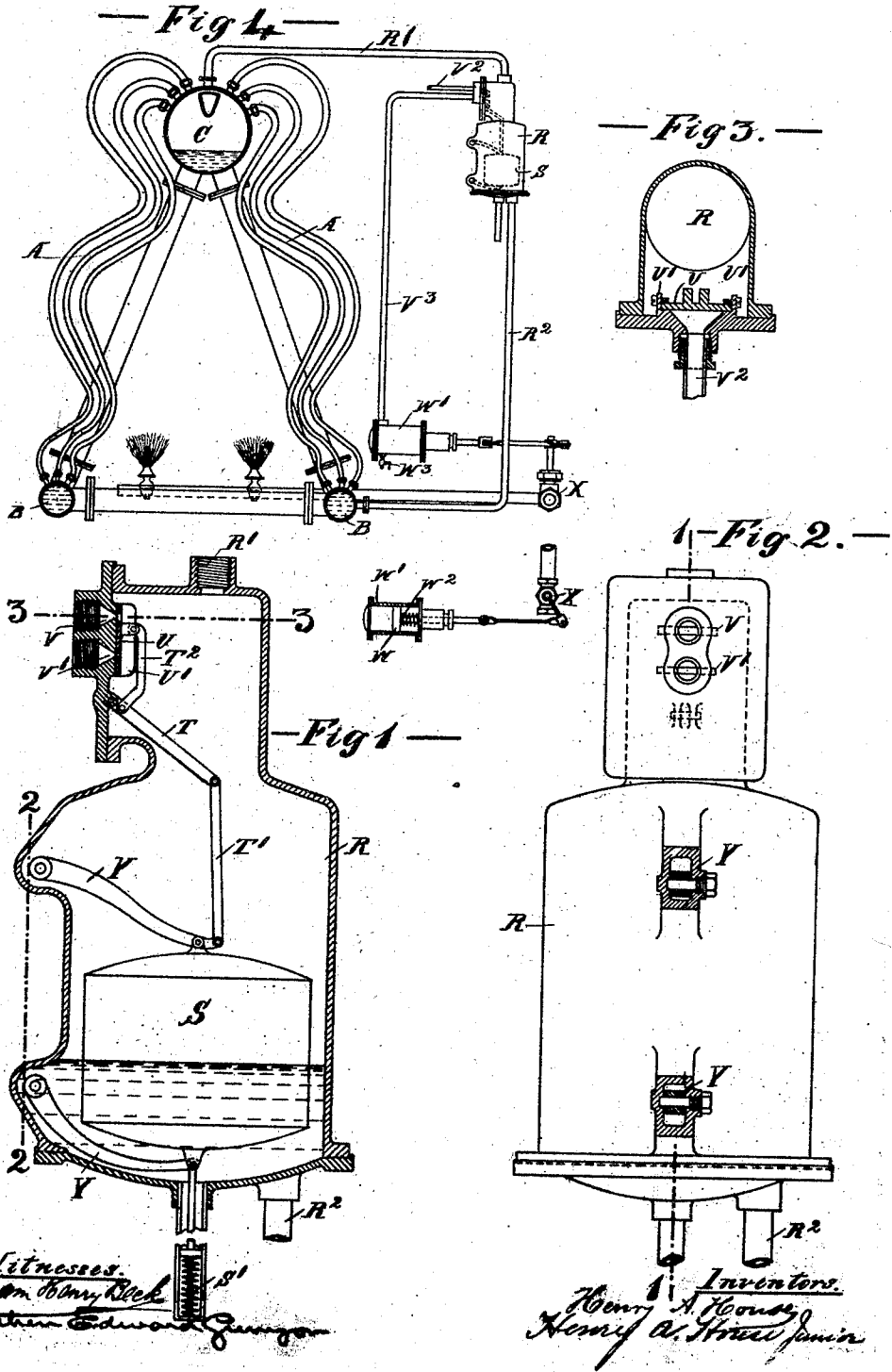


(No Model.)

H. A. HOUSE & H. A. HOUSE, Jr.
FEED WATER AND GAS SUPPLY REGULATOR.

No. 521,166.

Patented June 12, 1894.



UNITED STATES PATENT OFFICE.

HENRY A. HOUSE AND HENRY A. HOUSE, JR., OF BRIDGEPORT, CONNECTICUT, ASSIGNORS OF ONE-HALF TO ROBERT RINTOUL SYMON, OF LONDON, ENGLAND.

FEED-WATER AND GAS SUPPLY REGULATOR.

SPECIFICATION forming part of Letters Patent No. 521,166, dated June 12, 1894.

Application filed July 13, 1893. Serial No. 480,421. (No model.)

To all whom it may concern:

Be it known that we, HENRY ALONZO HOUSE and HENRY ALONZO HOUSE, JR., mechanical engineers, both citizens of the United States of America and both temporarily residing at Teddington, county of Surrey, England, but usually of Bridgeport, county of Fairfield, and State of Connecticut, United States of America, have invented a certain new or improved Feed Water and Gas Supply Regulator, of which the following is a specification.

In tubulous steam boilers or generators in which the quantity of water contained in them is comparatively small it is extremely important to maintain the level of the water as constant as possible and to reduce or extinguish the fire when the said level falls below a given point. For this purpose we employ an automatic feed water and gas supply regulator of the kind shown in Figures 1, 2, 3 and 4 of the annexed drawings, in which—

Fig. 1 is a vertical section taken on line 1—1 of Fig. 2; Fig. 2 a sectional elevation taken on line 2—2 of Fig. 1; Fig. 3 a sectional plan taken on line 3—3 of Fig. 1, and Fig. 4 shows the same apparatus to a smaller scale applied to a tubulous boiler or generator heated by gas.

A vessel R of any suitable shape is provided and fixed at the water level of the boiler or generator. The upper end of this vessel is connected by a pipe R' with the steam space C of the boiler and the lower end thereof by a pipe R² with the lower part of the water space B so that there is an equilibrium of pressure in the vessel R and in the boiler, and the water stands at the same level in both. A float S in the vessel R rises and falls with the water contained therein and operates by means of a lever T and links T' T², a slide valve U fitted to slide between guides U' in the upper part of the vessel R. This valve U governs two parts V V' the upper of which V leads by a pipe V² to any suitable self starting feed pump (not shown in the drawings, as we do not confine ourselves to any particular pump) and the lower of which V' leads by a pipe V³ to a regulating plunger or piston W working in a cylinder W' against

the resistance of a spring W² or of a weight which tends constantly to move the said plunger or piston in one direction. This plunger or piston operates the regulating tap or valve X of the gas burners by which the boiler is heated. If now the water level falls, the float S falls also, and lowers the slide valve U, uncovering the upper part V; steam then passes by pipe V² from the vessel R to the feed pump and sets it in motion, and feed water is introduced into the boiler or generator; but if from any cause the feed pump fails to start, or fails to force water into the boiler, and the water level falls still lower, the float S falls with it and the valve U is lowered still farther whereby the lower port V' is uncovered and steam passes by the pipe V³ to the cylinder W', acts upon the plunger or piston W therein and moves it forward against the opposing spring W² or weight and causes it to shut the gas tap or valve X thereby cutting off more or less completely gas from the burners and preventing the generation of any more steam until the defect has been remedied. When the water level rises again the float S rises also carrying with it the slide valve U which closes the lower steam port V' shutting off steam from the aforesaid cylinder W' the plunger or piston in which is then pressed back by its spring or weight and opens the gas valve X allowing the evaporation to proceed. The steam behind the plunger or piston W is allowed to escape, when the port V' is closed, through a weeping hole or properly adjusted tap W². On the other hand if the water level rises too high the float S rises still higher taking with it the slide valve U which then closes the upper steam port V, thereby stopping the feed pump and consequently the further delivery of feed water to the boiler. The port through the slide valve U corresponding to the port V is made wider than the port through the valve U corresponding to the port V' in order that the port V may remain open however low the float may descend in the vessel R, and until the proper level of water has been restored in the said vessel. The float S may be guided in its up and down movements by the piv-

oted arms Y or otherwise, and more or less of its weight may be counterbalanced if required by a spring S'.

We claim—

- 5 The new or improved apparatus for maintaining the level of the water in boilers or generators and for regulating the supply of gas for heating the same which consists of a closed chamber connected with the boiler or
10 generator, two steam ports, one leading to a self starting feed pump, and the other to an apparatus for regulating the supply of gas to the gas burners in the furnace of the boiler

or generator, a slide valve governing the said two steam ports and a float for actuating the said slide valve, combined, arranged and operating substantially as hereinbefore described. 15

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

HENRY A. HOUSE.

HENRY A. HOUSE, JUNIOR.

Witnesses:

WILLIAM HENRY BECK,

STEPHEN EDWARD GUNYON,

Both of 115 Cannon Street, London.