

No. 721,495.

PATENTED FEB. 24, 1903.

T. BAMFORTH & F. R. E. BRANSTON.

CONDENSING GAS STOVE.

APPLICATION FILED OCT. 7, 1902.

NO MODEL.

FIG. 1.

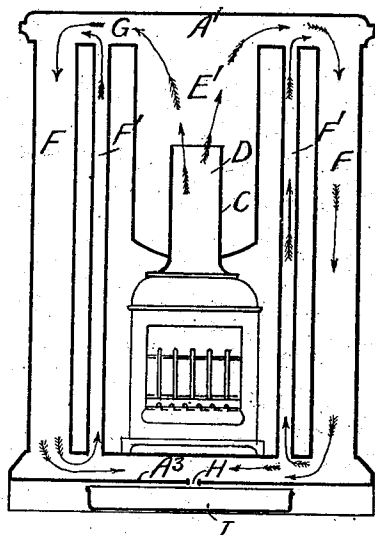


FIG. 3.

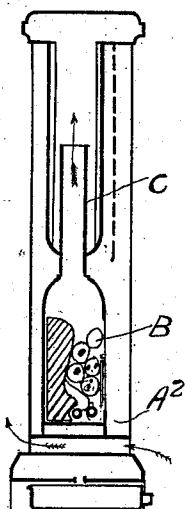


FIG. 4.

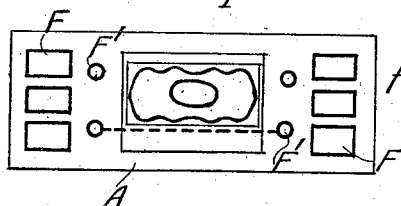
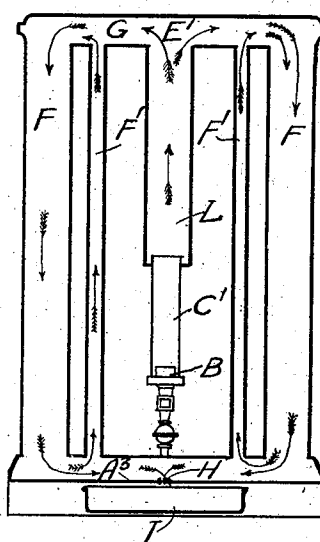
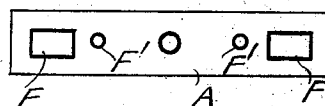


FIG. 2.

FIG. 5.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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EDWARD BRANSTON, OF EAST MOLESEY, ENGLAND.

## CONDENSING GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 721,495, dated February 24, 1903.

Application filed October 7, 1902. Serial No. 126,315. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS BAMFORTH, residing at Carron Works, Carron, county of Stirling, Scotland, and FREDERICK ROBERT EDWARD BRANSTON, residing at St. John's Road, East Molesey, county of Surrey, England, subjects of the King of the United Kingdom of Great Britain and Ireland, have invented certain new and useful Condensing Gas-Stoves and other Heating Apparatus, (for which application for patent has been made in Great Britain, No. 23,093, dated November 15, 1901, but for which patent has not been obtained,) of which the following is a specification.

This invention relates to gas-stoves and other heating apparatus of the kind in which the products of combustion are as far as possible condensed into a liquid; and it has for its object to improve the construction and action of such apparatus, so as to insure more complete condensation of the products of combustion within the apparatus.

In the accompanying drawings, which illustrate the invention, Figure 1 is a diagrammatic longitudinal elevation, Fig. 2 a plan, and Fig. 3 an end elevation, of a condensing gas-fire stove constructed in accordance with the invention; and Figs. 4 and 5 show, respectively, in diagrammatic form a longitudinal elevation and plan of such stove fitted with an Argand burner and a glass chimney.

As shown in the drawings, the improved apparatus comprises an inclosed tubular casing A, having fitted in it a gas-fire or an Argand burner B. The products of combustion pass from the point of ignition of the gas at B, are carried by a central tube C through an aperture D into a chamber or mid-compartment E' of the casing E, where they expand, and are thence carried into the upper part A' of the apparatus, from which they pass down tubes F at the sides and are induced through these tubes by smaller tubes F', which conduct the products in the form of vapor to the upper part of the apparatus, condensation taking place automatically, owing to the radiation of heat through the sides of the casing. The gases do not have a downward movement in the tubes F', for these tubes F' soon become hot, although they were

cold at starting, whereas the larger tubes F are cooler, and the gases being of high temperature do not take a downward course until they travel to a point beyond the orifice of the smaller tubes. Accordingly the gases are first turned into vapor in the larger tubes F, down which they pass, and the vapor is in turn induced upward into the gases in the upper part of the apparatus through the small tubes, the expansive force being increased by the introduction of the vapor and the liquid being formed without passing the hot gases over such a large cool metal surface as it would otherwise be necessary to do to produce satisfactory results.

The chief products of combustion are carbonic-acid gas and water, with small quantities of sulfuric and sulfurous acids, and these are carried off in a liquid form through an aperture H in the base A<sup>3</sup> of the apparatus. The condensed water is able to hold its own volume of carbonic-acid gas and absorbs the sulfur compounds entirely, while such carbonic-acid gas as remains over, together with unconsumed nitrogen of the air, escapes through the orifice H and passes into the room, and the liquid products drop into a tray I beneath said orifice.

When applied to a gas-fire, the furnace is constructed in such a manner that the air is drawn under the lower part A<sup>2</sup> of the apparatus, so that if placed in an ordinary fireplace the air of the room will be ventilated by its passing up the chimney in the ordinary way, the flow of the air also assisting in the action of condensation at the same time.

When made as an ordinary condensing gas-stove, as indicated at Figs. 4 and 5, the glass cylinder C' from the circular burner B is fitted into a cast-iron chamber L, one end of which is formed with an orifice to receive the glass cylinder, while the other discharges into the expansion-chamber E' above.

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

1. In a condensing gas-stove the combination with a burner, a casing surrounding the same, an expansion-chamber into which the burner discharges and a hollow base for said casing, of down-comer tubes connecting the

expansion-chamber with the hollow base and smaller tubes connecting the hollow base and expansion-chamber to act as induction-tubes for circulating the products of combustion as described.

2. In a condensing gas-stove the combination with a burner, a casing surrounding the same, an expansion-chamber into which the burner discharges, and a hollow base for said casing of down-comer tubes connecting the expansion-chamber with the hollow base, smaller tubes connecting the hollow base and

expansion-chamber to act as induction-tubes for circulating the products of combustion and a tray beneath an aperture in the hollow base to receive condensed combustion products, as and for the purpose set forth.

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

THOMAS BAMFORTH.

FREDERICK ROBERT EDWARD BRANSTON.

Witnesses:

WALLACE CRANSTON FAIRWEATHER,  
JNO. ARMSTRONG, Jr.