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FLASH TUBE IGNITER FOR BURNERS AT DIFFERENT LEVELS

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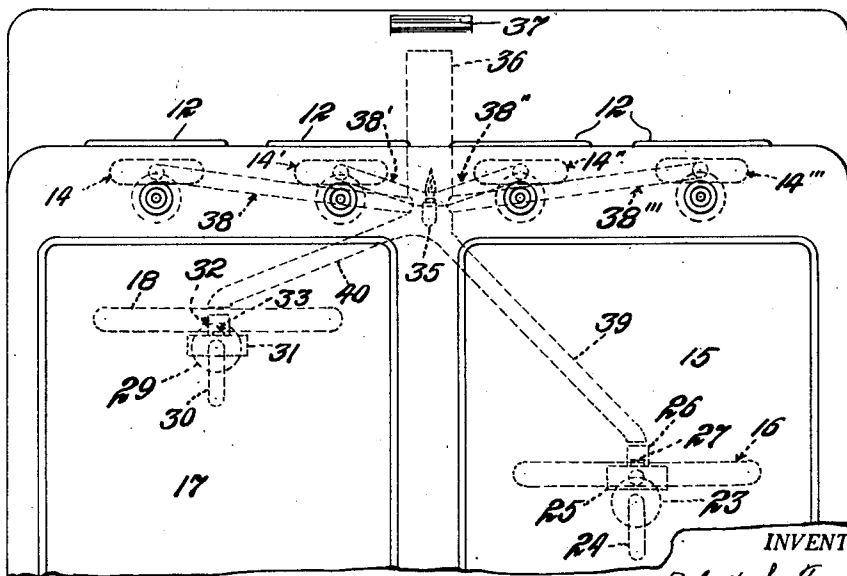
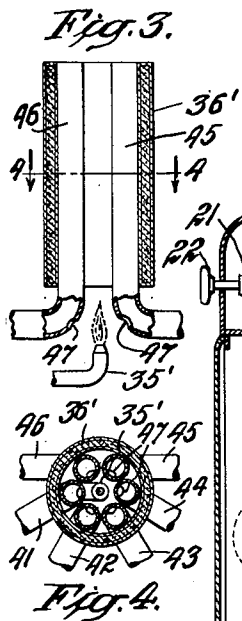
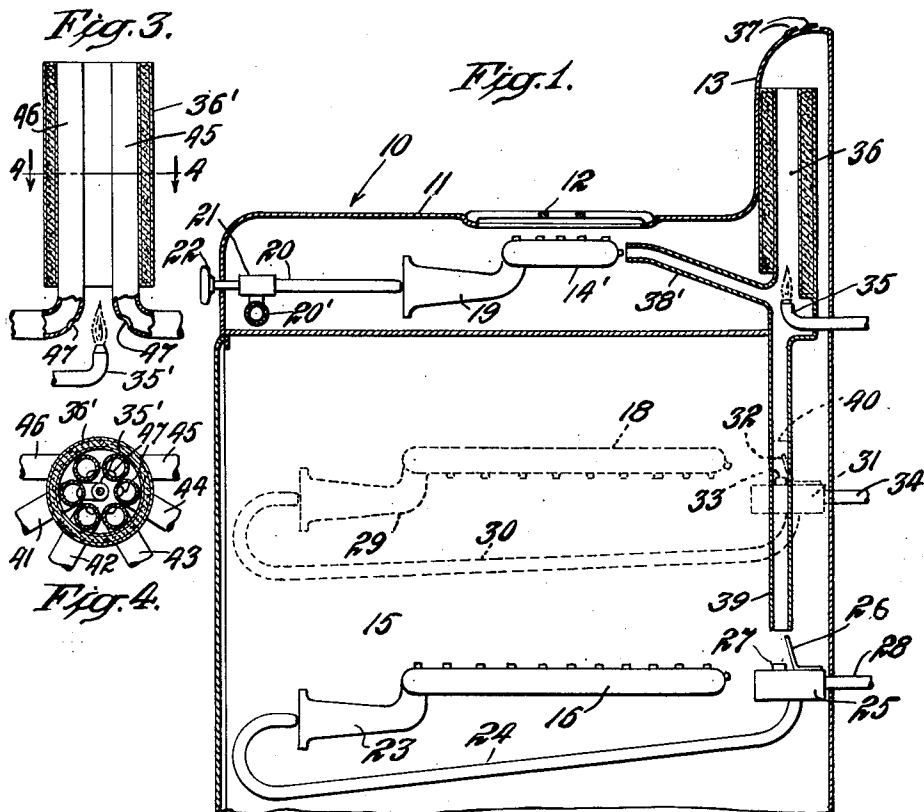


Fig. 2.

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## UNITED STATES PATENT OFFICE

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FLASH TUBE IGNITER FOR BURNERS AT  
DIFFERENT LEVELSRobert S. Taylor, Evansville, Ind., assignor to  
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My invention relates to gas igniters and more particularly to gas igniters wherein a single constantly-burning pilot light is utilized to ignite gas at the oven and broiler burners as well as at the cooking top burners of a domestic gas range.

In the lighting of the several burners of a gas range, it is desirable to use a single constantly-burning pilot in order to reduce gas consumption. However, when the oven and broiler burners are located an appreciable distance below the top burners, which is the usual arrangement, it has been a problem to design a reliable and efficient system of flash tubes that will ignite the several burners from a single pilot; consequently, separate pilots or electrical ignition means have usually been provided for the different burners.

It is an object of my invention to provide a system of flash tubes whereby all of the burners of a gas range, though located at different elevations, may be ignited by a single pilot.

It is a further object of my invention to provide a system of flash tubes whereby a combustible air-gas mixture is drawn from several burners, located at different elevations, to a single pilot for ignition, whereupon a flash-back occurs through the different flash tubes to ignite the several burners.

It is a further object of my invention to provide a constantly-burning pilot for igniting the several burners of a gas range, and of eliminating the usual "hot spot" that a constantly-burning pilot generally produces in the cooking top of such range.

These and other objects and advantages of my invention will become more apparent when considered in connection with the following description and accompanying drawing, wherein:

Fig. 1 is a view partly in side elevation and partly in vertical section through a gas range incorporating one embodiment of my invention;

Fig. 2 is a front view of the gas range illustrated in Fig. 1 and showing my improved system of flash tubes in broken lines;

Fig. 3 is a vertical view, partly in section, of a second embodiment of my invention;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Referring now to Figs. 1 and 2 of the drawing, 10 designates generally a table-top cooking range provided with a working top 11, four top burner grates 12, a back guard 13, four top burners 14, 14', 14'' and 14''', an oven 15, an oven burner 16, a broiler 17, and a broiler burner 18. The top burners 14, 14', 14'' and 14''' are each provided with a mixing tube 19, a gas supply conduit 20 leading from a conventional manifold 20', and a

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control valve 21 operated by a handle 22. The oven burner 16 is provided with a mixing tube 23, a gas supply conduit 24, a safety cut-out valve 25, controlled by a thermal element 26 which is heated by a pilot 27, and a gas supply conduit 28 equipped with a suitable manually-actuated valve, not shown. The broiler burner 18 is provided with a mixing tube 29, a gas supply conduit 30, a safety cut-out valve 31, controlled by a thermal element 32 which is heated by a pilot 33, and a gas supply conduit 34, which is also equipped with a manually-operated valve, not shown. The above-described structure represents a more or less conventional domestic cooking range with which my improved burner igniter is adapted to be incorporated.

One embodiment of my improved burner igniter comprises a constantly-burning pilot 35 located in the lower part of an insulated flue 36, which in turn is located in the central portion of the back guard 13 directly beneath venting louvers 37. The flash tubes 38, 38', 38'' and 38''' lead from the top burners 14, 14', 14'' and 14''', respectively, and converge in the lower front portion of the flue 36 in the immediate vicinity of the constantly-burning pilot 35. A flash tube 39 leads from the oven burner pilot 27 and is connected to the lower right side of the flue 36, as viewed in Fig. 2. A similar flash tube 40 leads from the broiler burner pilot 33 and is connected to the lower left side of the flue 36. The flash tubes 38, 38', 38'', 38''', 39 and 40 are so dimensioned and arranged that the resistance to flow is substantially the same through each of these tubes. In other words, the chimney effect produced by the flue 36 should be distributed more or less uniformly between the several flash tubes.

In operation, the constantly-burning pilot 35 having been ignited the products of combustion therefrom pass upward through the flue 36 producing a chimney effect in said flue. The heat from said constantly-burning pilot which is not dissipated by the flue, passes with the products of combustion out through the louvers 37 in the top central portion of the back guard 13. By this arrangement, the heat produced by the constantly-burning pilot 35 is either dissipated by the flue 36 or it passes, harmlessly through the louvers 37 and does not produce a "hot spot" as is usual with a constantly-burning pilot located directly beneath the top working surface of a conventional gas range. Furthermore, by arranging the constantly-burning pilot in a flue it is protected from drafts which might otherwise extinguish its flame.

Assume now that the oven burner 16 is to be

lighted, the oven control valve, not shown, is opened and fuel gas is supplied through conduit 23 to the safety cut-out valve 25 and to the oven pilot 27. The chimney effect produced by the constantly-burning pilot 35 in the flue 36 draws the fuel gas from the oven pilot 27 and air from adjacent the low portion of the oven flash tube 39 up through said flash tube to the constantly-burning pilot 35 where the air-gas mixture is ignited and the flame flashes back through the flash tube 39 and ignites the gas issuing from the oven pilot 27. The pilot 27 then heats the thermal element 26 which causes the safety cut-out valve 25 to open and supply fuel gas through conduit 24 and mixing tube 23 to the oven burner 16. The air-gas mixture issues from the oven burner 16 and is ignited by the oven pilot 27. The oven pilot 27 continues to burn so long as gas is supplied thereto through conduit 28. If the flame of the oven pilot 27 is accidentally extinguished, it is immediately re-ignited by the constantly-burning pilot 35. If, however, the oven pilot 27 is not immediately re-ignited, the thermal element 26 cools down and closes the safety cut-out valve 25. The thermal element 26 may be so arranged that so long as either the oven pilot 27 or the oven burner 16 is lighted said element will remain heated and the cut-out valve 25 will remain open. The procedure in lighting the broiler burner 18 is substantially the same as that described for the oven burner 16. In practice, the safety cut-out valves and pilots may be eliminated from the oven and broiler burners, in which event gas would be drawn directly from the oven and broiler burners into the flash tubes 39 and 40, respectively.

Assume now that the top burner 14', for example, is to be ignited, the valve 21 of this particular burner is manually opened and gas passes through conduit 20 into mixing tube 19, where it is mixed with air, and the air-gas mixture issues from the top burner 14'. As this air-gas mixture issues from top burner 14' some of it is drawn into and through the flash tube 38' to the constantly-burning pilot 35 by the chimney effect of the flue 36, where it is ignited and the flame flashes back through the flash tube 38' to ignite the air-gas mixture issuing from the burner 14'. The procedure in lighting the other top burners is substantially identical with that described for the top burner 14'.

Referring now to Figs. 3 and 4 of the drawing, wherein a second embodiment of my invention is illustrated, 35' designates a constantly-burning pilot and 36' an insulated flue, generally similar to the pilot 35 and the flue 36, respectively, of Figs. 1 and 2. Six flash tubes 41, 42, 43, 44, 45 and 46, corresponding generally to the flash tubes 38, 38', 38'', 38''', 39 and 40, respectively, of Figs. 1 and 2 are provided, each having one of its ends arranged in the flue 36', its opposite end terminating near a burner in the same manner as the corresponding flash tubes of Figs. 1 and 2, and each provided with a small opening 47 in the immediate vicinity of the constantly-burning pilot 35'. The arrangement is such that the constantly-burning pilot 35' heats the portions of the flash tubes which are located in the flue 36' to produce a chimney effect in each of these tubes to thereby draw an air-gas mixture from their respective burners, or pilots, up to the constantly-burning pilot 35' where said air-gas mixture is ignited and the flame flashed back to the respective burners. The openings 47 should be small enough so as not to appreciably inter-

fere with the upward draft in the tubes and yet large enough for the air-gas mixture to be ignited at these openings and flash back through the tubes to the respective burners. In other respects, the arrangement of the constantly-burning pilot 35', the flue 36', the different burners, the pilots, and the different flash tubes leading from the burners up to the flue 36' is the same with the second embodiment of my invention as with the first embodiment illustrated in Figs. 1 and 2. Therefore, further discussion of this second embodiment is deemed unnecessary.

While I have illustrated and described but two specific embodiments of my invention, it obviously may take other forms and it may have other uses. My invention, therefore, is limited only by the following claims.

What I claim is:

1. An igniter for a gas range equipped with a back guard, top burners, an oven burner and a broiler burner, said igniter comprising a pilot located directly beneath said back guard, a flue arranged above said pilot within said back guard, and a plurality of flash tubes each having one end located in the immediate vicinity of one of said burners and each having its opposite end terminating in the lower portion of said flue immediately adjacent the pilot, thereby producing a chimney effect in each of said flash tubes whereby an air-gas mixture is drawn through said flash tubes to said pilot to be ignited thereby and the flame flashed back through said flash tubes to ignite said burners.

2. An igniter for a plurality of gas burners located at different elevations, said igniter comprising a flue, a pilot arranged in a lower portion of said flue, and a plurality of flash tubes each having one end operatively associated with one of said plurality of gas burners and each having its opposite end terminating in the lower portion of said flue, said flue being of such height that products of combustion from said pilot in passing upwardly therethrough produce a chimney effect of such intensity in said flash tubes that an air-gas mixture is drawn from said gas burners through said flash tubes to said pilot.

3. An igniter for a plurality of gas burners, said igniter comprising a pilot, a flue having a lower portion thereof surrounding said pilot, and a plurality of flash tubes each having one end operatively associated with one of said gas burners and each having its opposite end opening into the lower portion of said flue, said flue being of such height that a chimney effect of such intensity is produced in each of said flash tubes that an air-gas mixture is drawn from said gas burners through said flash tubes to said pilot.

4. An igniter for a plurality of gas burners located at different elevations, said igniter comprising a pilot located below certain of said plurality of gas burners and above certain other of said plurality of gas burners, a flue having a lower portion thereof surrounding said pilot, and a plurality of flash tubes, one leading from each of said burners and each having one end operatively associated with said flue in the immediate vicinity of said pilot, said flue being of such height that a chimney effect of such intensity is produced in each of said flash tubes that an air-gas mixture is drawn from said gas burners through said flash tubes to said pilot.

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