Aug. 20, 1935. E. L. HALL ET AL 2,012,004

GAS PILOT LIGHT CONTROL APPARATUS

Filed April 24, 1933 2 Sheets-Sheet 1

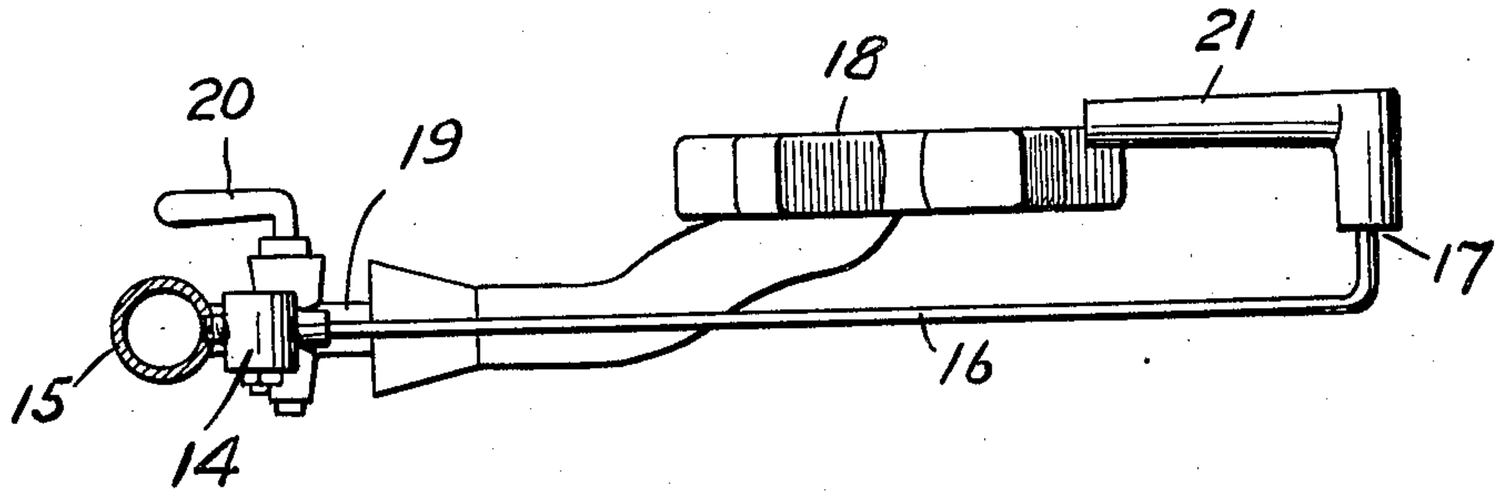

FIG. 2.

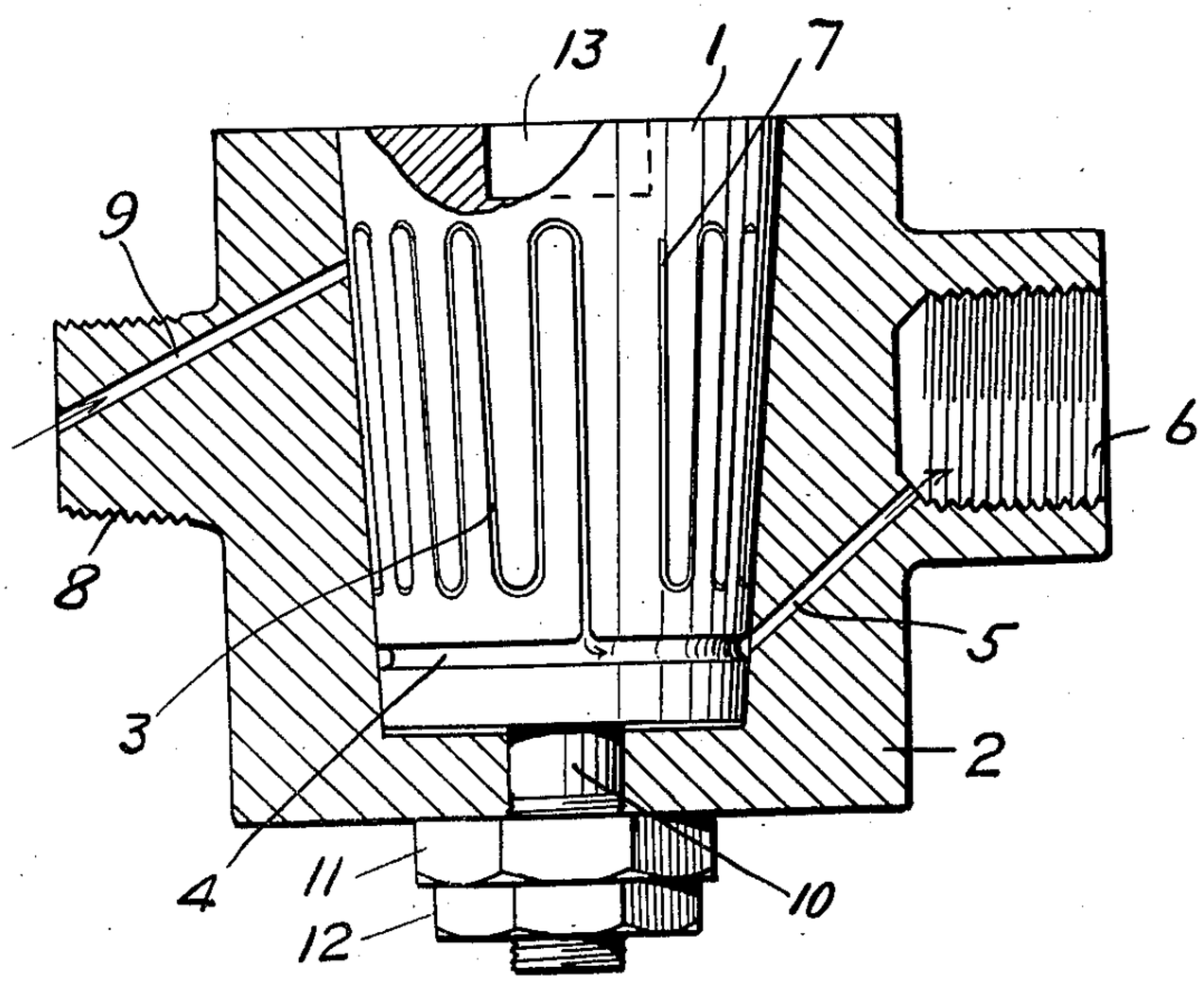

FIG. 1.

INVENTORS
Edwin L. Hall
Edward J. Brady
BY
Augustus B. Stoughton
ATTORNEY.

WITNESS:
Ralph R. Ketchel.

Aug. 20, 1935. E. L. HALL ET AL 2,012,004

GAS PILOT LIGHT CONTROL APPARATUS

Filed April 24, 1933 2 Sheets-Sheet 2

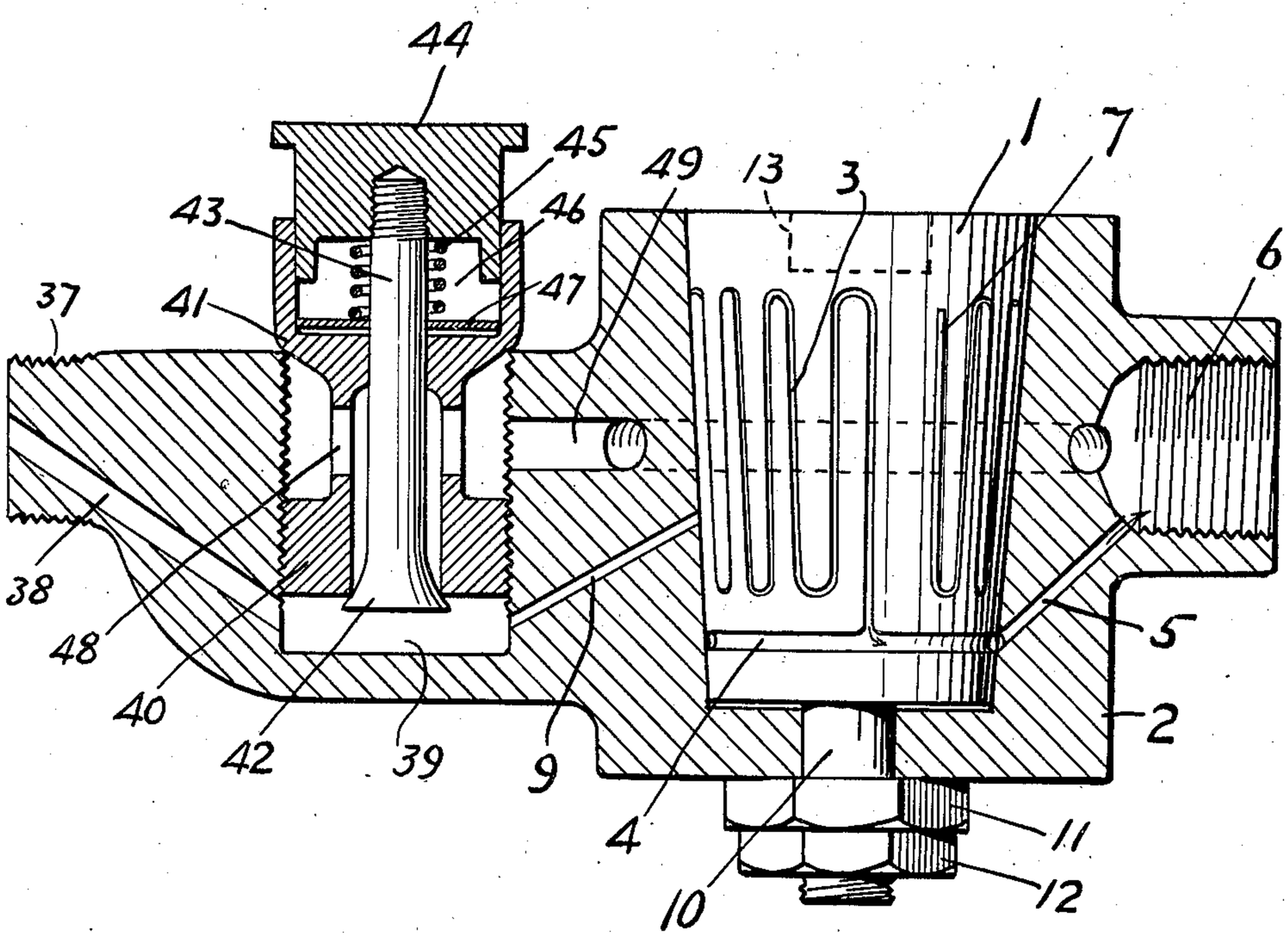

FIG. 3.

WITNESS:
Robt P. Kitchel.

INVENTORS
Edwin L. Hall and
Edward J. Brady
BY
Augustus B. Stoughton.
ATTORNEY

Patented Aug. 20, 1935 2,012,004

UNITED STATES PATENT OFFICE

2,012,004

GAS PILOT LIGHT CONTROL APPARATUS

Edwin L. Hall, Philadelphia, and Edward J. Brady, Swarthmore, Pa., Adele S. Brady, administratrix of said Edward J. Brady, deceased, assignors to The United Gas Improvement Company, Philadelphia, Pa., a corporation of Pennsylvania

Application April 24, 1933, Serial No. 667,651

3 Claims. (Cl. 251—92)

The present invention relates to gas pilot lights. More particularly the invention relates to gas pilot light apparatus in which the desired low flow of gas to the pilot burner is secured by causing the gas, on its way to the pilot burner, to flow through a relatively long tortuous capillary passage formed as a groove in a surface tightly pressed against a second surface to confine the flow of gas to the groove.

This method of pilot flow control is much less liable to pilot outage than flow control by needle valve or other orifices or short passages because in these latter mentioned methods to secure the desired low flow the width of the orifice or short passage must be very small and tends to become stopped by small quantities of gum or dust.

For instance, present gas range pilots are usually controlled by needle valve orifices which when adjusted for a typical pilot flow of 0.2 to 0.3 cubic foot per hour at a typical gas pressure of 3.5 inches of water may only have a width of approximately .00028 inch.

The width and depth of the long groove may be very many times the width of such an adjusted needle valve. We prefer not to employ a groove having a width or depth less than .02 inch which which is 70 times the above needle valve orifice width.

The stoppage of these needle valve pilots is a cause of constant expense to gas distributing companies and is a source of danger due to possible asphyxiation or explosions in modern gas appliances which are turned on intermittently by automatic means.

The principal object of the present invention is to provide pilot flow control apparatus employing a long tortuous capillary groove channel for the control of the gas flow, which is readily adjustable for different conditions of gas pressure and desired flow.

The invention will be described in connection with the accompanying drawings which form a part of this specification and which illustrates a form of the apparatus chosen for illustration and in which—

Fig. 1 shows in elevation and cross section a form of the gas flow control of the invention.

Fig. 2 shows principally in elevation the apparatus of Fig. 1 connected to the burner bar of a gas range and to the pilot burner.

Fig. 3 shows principally in vertical cross-section a modified form of apparatus.

1 indicates a body similar to a cock plug provided with an external conical surface and which is seated in a seat member 2 provided with a corresponding interior conical surface.

The plug 1 is provided in its conical surface with the long back and forth capillary groove 3 which terminates at one end in the annular groove 4, with which is registered the passage 5 in the seat member, leading therethrough to the threaded opening 6 into which may be screwed a pipe leading to the pilot burner. The other end of the groove 3 is indicated at 7.

The seat member 2 is provided with the threaded lug 8 adapted to be screwed into a tapped hole in the burner bar of a gas range. 9 is a passage leading through the lug 8 and arranged to register with the upper ends of passes of the groove 3.

The plug 1 is provided with the cylindrical stem 10 which extends through a close fitting opening in the seat member 2 and is threaded to receive the tightening nut 11. 12 is a lock nut.

The plug 1 is recessed at 13 for insertion of a tool for turning the plug.

When the nuts 11 and 12 are tightened the plug 1 is drawn down tightly into the bore of the seat member 2 and held against rotation. When the nuts are loosened the plug 1 may be rotated so as to register the inner end of the passage 9 with successive passes of the groove 3, bypassing all portions of the groove between its end at 7 and the inner end of passage 9. The end of the passage 9 may be arranged to register over two groove passages in such manner that full opening into one pass is insured. Marks may be placed on the top of the plug and the seat member to indicate the portion of the groove in the gas path.

Referring to Fig. 2, 14 generally indicates the apparatus of Fig. 1. 15 is the burner bar of a gas range. 16 the pipe leading to the pilot burner 17. 18 is a cooking burner supplied by gas from the burner bar through pipe 19 as controlled by cock 20. 21 is an ignition tube.

In the operation of the apparatus of Figs. 1 and 2 gas passes continuously from the burner bar through passage 9 and through that portion of groove 3 extending between passage 9 and the annular groove 4. From groove 3 the gas passes through the annular groove 4 and through passage 5 and pipe 16 to the pilot burner 17.

When the burner 18 is to be ignited, the cock 20 is turned and gas is supplied to the burner through pipe 19. The gas issuing from some of the burner ports passes through the tube 21 to the pilot burner 17, ignites and flashes back igniting the gas issuing from the other ports of burner 18.

The control apparatus of Fig. 1 may be econom-

ically manufactured. It may be provided in a small unit. For instance 50 inches of groove .035 inch wide and having a cross sectional area equivalent to a circle of .035 inch diameter may be readily provided in a plug one inch in diameter and one and one-half inches long. Such a groove is very much less liable to stoppage than a needle valve adjusted for the same flow under the same conditions.

The apparatus may be readily adjusted to give substantially the same flow under widely different pressure conditions by rotating the plug and increasing or decreasing the length of groove in the path of the gas, the length being increased for higher pressures and decreased for lower. Or widely varying flows may be secured for the same pressure conditions, adapting the same size control for a variety of appliances. The shorter the length of groove the higher the flow and the longer the length of groove the lower the flow under the same pressure.

The distance between the pass of the groove 3 terminating in groove 4 and the end pass terminating at 7 may be made great enough to cover the end of the passage 9 when the plug is so rotated, providing means to shut off the pilot flow if desired.

Or the seat may be provided with a separate channel arranged in communication with the torch flow outlet passage of the "Rutz" lighter valve and leading to the annular groove 4 which groove and the passage 5 are made of sufficient size to carry the torch flow. A passage corresponding to 9 is arranged to communicate with the pilot flow bypass in the "Rutz" valve body. In this latter case the pilot gas flows through the pilot bypass in the "Rutz" lighter body which is arranged without needle valve control and from thence through the passage corresponding to passage 9 and thence through the plug groove to the annular groove 4 and to the pilot burner as before.

When the "Rutz" lighter torch valve is opened the torch flow gas passes through the valve and through the torch flow outlet passage in the "Rutz" lighter body to the separate passage in the plug seat and thence through the annular groove 4 and passage 5 to the pilot burner.

The modification of my device containing a modified torch gas range lighter of the "Rutz" type is shown in Fig. 3, where there is shown body 1 mounted in casing 2. Body 1 carries on its outer surface a nonrectilinear groove 3, which terminates at one end in an annular groove 4 which registers with passage 5 in seat member 2 leading to a threaded opening 6. 7 designates an inlet bypass passage having an end adapted to join with a portion of groove 3. Body 1 carries at one end a cylindrical stem 10, adapted to receive tightening nut 11 and lock-nut 12 to adjustably secure the body in casing 2. Body 1 has a recess 13 for the insertion of a tool for adjusting the length of groove 3, which lies between passage 9 and groove 4.

At its opposite end, seat member 2 has a threaded portion 37 containing an inlet passage 38 leading to a chamber 39, from which leads the inlet bypass passage 9. Chamber 39 is screw-threaded for the insertion of a valve seat member 40 having an upstanding flange 41 and ports 48 therein. Torch flow passage 49 leads through seat member 2 to outlet 6. Within valve seat 40 is mounted valve 42, having a stem 43 screw-threadedly engaged with button 44, which has sliding engagement with the inner side of flange 41. Spring 45 is located in chamber 46 and bears at its lower end against a washer 47 surrounding valve stem 43. When valve 42 is closed against valve seat 40, the bypass flow of gas flows through 38—39 and a portion of groove 3—4—5—6. When valve 42 is opened, the torch flow of gas flows through 38—39—48—49 to 6.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of construction and arrangement and matters of mere form without departing from the spirit of the invention which is not limited to such matters, or otherwise than the prior art and the appended claims may require.

We claim:

1. A gas pilot light control comprising, in combination, a plug valve casing having inlet and outlet gas connections, and a plug turnably mounted in the casing and having an annular groove in communication with the outlet gas connection and having a sinuous groove of which one end communicates with the annular groove and of which the passes are aligned with the inlet gas connection to vary the effective length of the groove.

2. A gas pilot light control comprising, in combination, a plug valve casing having inlet and outlet gas connections, a plug turnably mounted in the casing and having on its curved surface a sinuous groove of which the passes are aligned with one of said gas connections and of which an end communicates with the other of said gas connections to vary the effective length of the groove.

3. A gas pilot light control comprising, in combination, a plug valve casing having inlet and outlet gas connections, a plug turnably mounted in the casing and having on its curved surface a sinuous groove of which the passes are spaced to provide a surface for covering and uncovering one of said gas connections, and said groove adapted to be included in greater and less extent between said connections.

EDWIN L. HALL.
EDWARD J. BRADY.