

Feb. 1, 1944.

J. K. CLARK

2,340,734

SAFETY PILOT BURNER

Original Filed May 29, 1939

2 Sheets-Sheet 1

Fig. 1.

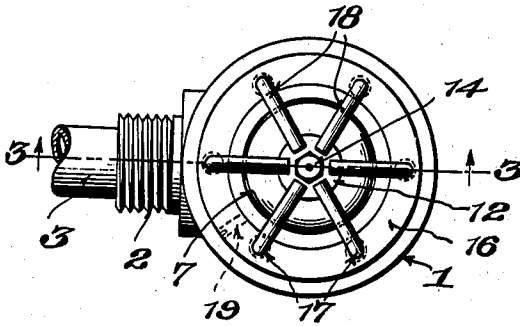


Fig. 2.

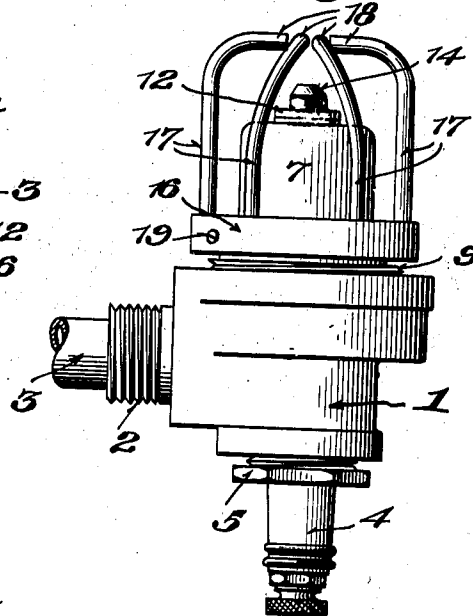
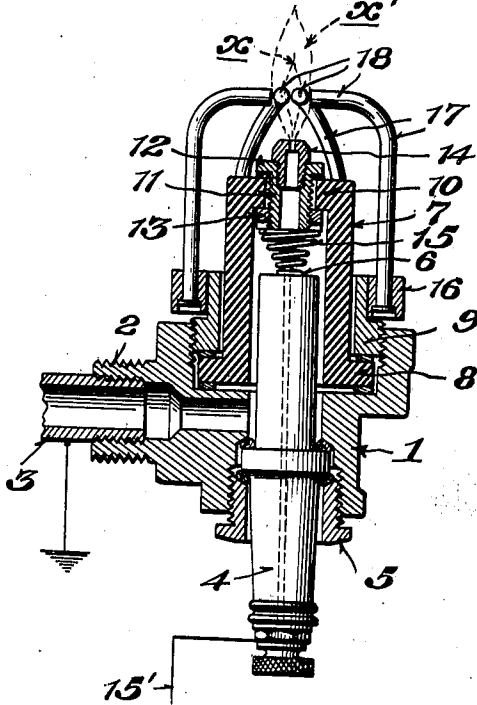


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

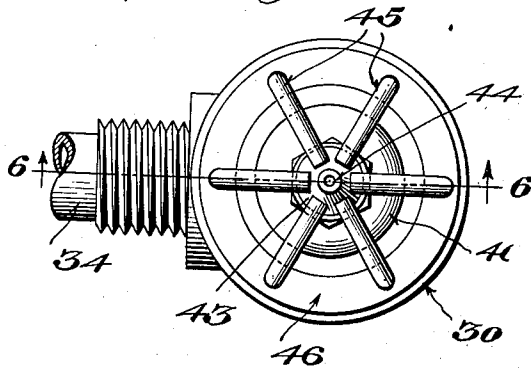


Fig. 5.

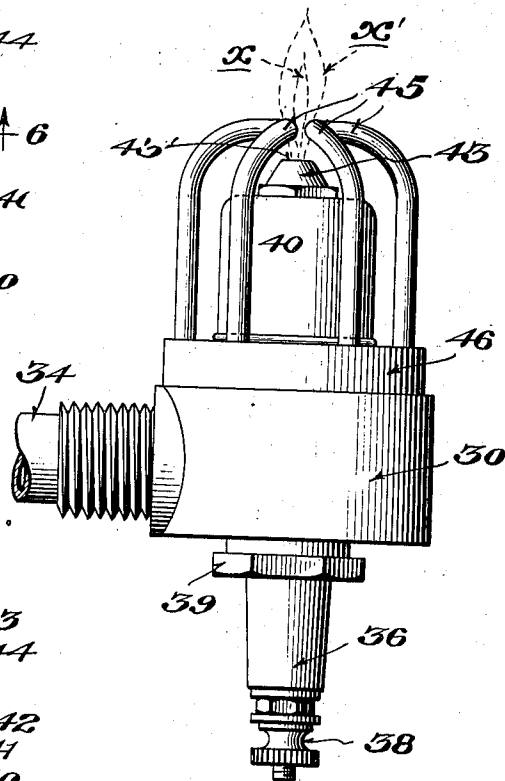
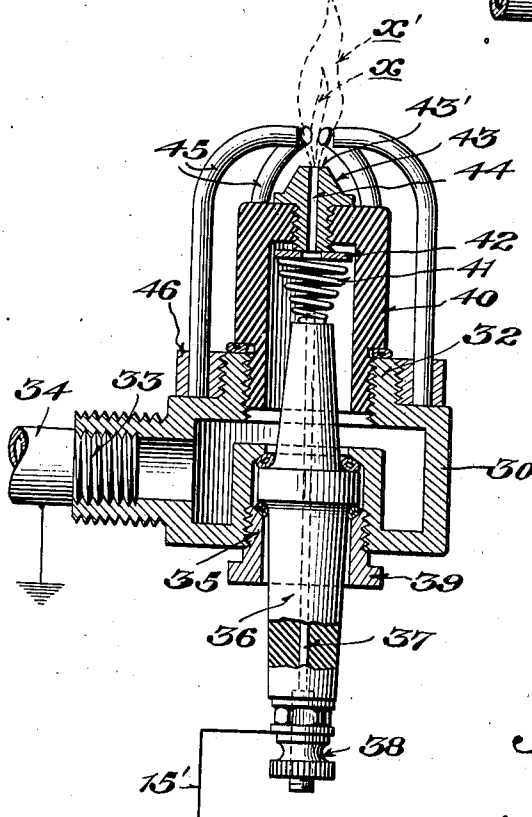


Fig. 6.



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UNITED STATES PATENT OFFICE

2,340,734

SAFETY PILOT BURNER

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Original application May 29, 1939, Serial No. 276,475. Divided and this application March 21, 1941, Serial No. 384,567

6 Claims. (Cl. 158—115)

This invention relates to safety pilot burners, more particularly for use with gas-burning furnaces, ovens, and the like, as disclosed in my Patent No. 2,152,790, April 4, 1939. The invention disclosed herein has been divided out of my co-pending application Serial No. 276,475, filed May 29, 1939, Safety pilot burner, now patent 2,241,295, May 6, 1941.

The primary object of the invention is to provide an improved pilot burner which is of maximum efficiency in affording safety against extinguishment of the flame.

Another object of the invention is to increase the activity of ionization and to improve conduction of the current across the spark gap.

Further, the invention resides in the structure and organization or combination of the parts, as fully hereinafter described and claimed.

In the drawings:

Fig. 1 is a top plan view of the pilot burner, in accordance with one form of the invention;

Fig. 2 is a side elevation;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a top plan view of the pilot burner disclosed in my said patent;

Fig. 5 is a side elevation; and

Fig. 6 is a section on line 6—6 of Fig. 4.

In the form of the invention shown in Figs. 1-3, a hollow body 1 is provided and is formed with a lateral nipple 2 connected to a branch 3, which in turn is connected to a raw gas source of supply. A porcelain insulator 4 is secured to the body by a nut 5, and is equipped with a metal electrode 6 which projects from its upper end. An insulator 7 of cylindrical form has an outwardly extending flange 8 at its bottom engaged by a ring nut 9 threaded into engagement with the upper end of the body 1, and by virtue of which the insulator is rigidly clamped in position.

The upper end of the insulator 7 is provided with an inwardly extending flange 10, through which extends a sleeve 11 having a flange 12 at its top that overlies the flange 10, and is clamped in position by means of a nut 13, engaging the under face of the flange 10. A metal burner tip 14 is threaded into the outer end of sleeve 11.

A coil spring conductor 15, preferably of bronze, is interposed between the upper end of the porcelain member 4 and nut 13, and engages the protruding end of electrode 6. The upper portion of the nut 9 slidably receives thereover a ring 16, which has suitably secured thereto a series of substantially inverted L-shaped elec-

trodes 17. The lower ends of the electrodes may be anchored in the ring 16, for example by brazing or welding as depicted. The upper ends 18 of the electrodes confront one another and overlies the tip 14, being spaced therefrom and radiate from the tip, in effect forming substantially a ring of metal thereabout. The ends 18 of the electrodes are preferably equally spaced and due to their described arrangement, afford positive crossing of the spark gap, in operation. The electrode carrying ring 16 by virtue of its vertical sliding movements may accordingly be adjusted to vary the width of the gap, and is fixedly held in selected position by means of a set screw 19.

The form of the invention depicted in Figs. 4-6, is that disclosed in my said patent, and for the sake of clarity in identification, the same reference characters are employed therein, as in the said patent.

Accordingly, a hollow body 30 is provided, and which is formed with an upwardly facing internally and externally threaded nipple 32, a lateral similarly threaded nipple 33 which is supplied with raw gas by the branch 34, and a downwardly facing internally threaded opening 35 in which is disposed a porcelain insulator 36 that protects a metal electrode 37 which extends axially in the porcelain, and whose bottom end is equipped with a binding-post 38. The porcelain 36 is held in place by a gland-nut 39, which threads into the bottom opening of the body 30. In order to further insulate the high tension electrical parts of the pilot burner, an inverted cup-shaped cylindrical lava part 40 whose reduced bottom end is threaded, screws into the nipple 32, which is axial to the porcelain 36. The top end of the electrode member 37 is fitted with a spring 41, which is capped with a washer 42 that frictionally engages the reduced lower end of a threaded metal conductor or terminal 43, having an axial gas passage or orifice 44, which forms one side of the spark gap x . This produces a continuous sole and free passage for the gas delivered by the branch 34. The gas when burning, forms the flame x' , shown in Figs. 3 and 6.

The spark gap x is then completed by the top end 43' of the terminal 43 and a plurality of equally spaced metal electrodes 45, which are anchored in a threaded collar or nut 46 that screws onto the nipple 32. The upper ends of the electrodes 45 are preferably equally spaced and bent inwardly radially so as to facilitate the

certain crossing of the gap as the various exigencies of the pilot burner arise.

By the provision of the relatively large number of the electrodes 45 and the regular spacings of their free tips, a ring of metal is formed that aligns axially with the terminal 43, and the other insulating supports render failure of the pilot burner practically impossible.

In each instance, the gas supply pipe is grounded and the electrode 6 and 37 connected in the line 15', as disclosed in my said patent, and as indicated in Fig. 3 and Fig. 6 of the instant application.

What is claimed is:

1. A pilot burner, including a body having an insulated electrode therein, a burner tip insulated from said burner body, means to electrically connect the electrode to the burner tip, and a series of electrodes spaced from, surrounding and overlying the burner tip and having free ends which are in confronting spaced relation to one another so as to form in effect the equivalent of a continuous ring-like arrangement thereabout and being further so positioned with respect to the burner tip that at least one of said electrodes will contact the flame issuing from said burner tip, regardless of the direction of an extinguishing draft.

2. A pilot burner in accordance with claim 1 wherein the means electrically connecting the insulated electrode to the burner tip includes a coil spring.

3. A pilot burner in accordance with claim 1, wherein the electrodes of the series are each of

substantially inverted L-shape and are connected at their lower ends to a ring, said ring being electrically connected to said burner body.

4. A pilot burner in accordance with claim 1, wherein the electrodes of the series are carried by a vertically adjustable member and wherein there is means to hold the member in selected vertical positions.

5. A pilot burner including a body having an insulated electrode therein, a burner tip insulated from said burner body and being electrically connected to said electrode, a coil spring interposed between and electrically connecting the electrode and burner tip, a ring-like member surrounding and electrically connected to said burner body and a series of substantially inverted L-shape electrodes connected at their lower ends to said member and having their other ends free, spaced from and overlying the burner tip, said free ends being disposed in confronting spaced relation to one another so as to form in effect the equivalent of a continuous ring-like arrangement about said burner tip and being further so positioned with respect to the burner tip that at least one of said electrodes will contact the flame issuing from said burner tip, regardless of the direction of an extinguishing draft.

6. A pilot burner in accordance with claim 5, wherein the ring-like member is vertically adjustable and wherein there is means to hold the member in adjusted position.

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