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PILOT LIGHT BURNERS

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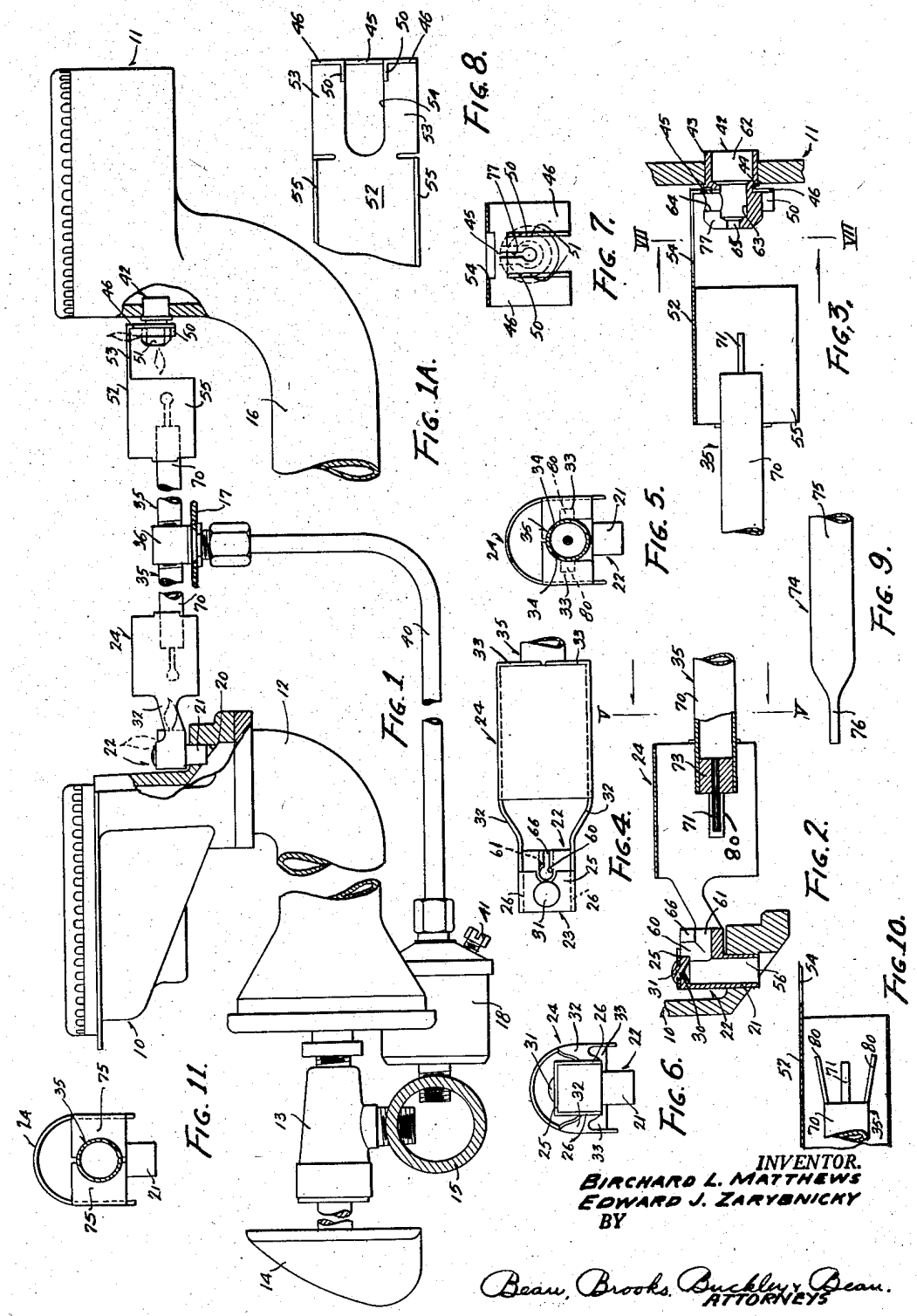

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PILOT LIGHT BURNERS

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The invention has to do specifically with pilot light burners for use in connection with gas burners such as may be used in ranges, water heaters and the like.

The principal object of the invention is to provide a faster lighting pilot burner having lower fuel consumption.

Another object is to provide a pliot burner which is located adjacent to the side of the gas burner and which will remove the objection to a "hot spot" on the top of the burner caused by the present day pilot light.

Another object is to provide a pilot burner with a very small port thus reducing the B.t.u. consumption.

A further object is to provide a pilot burner having a small orifice formed with a thin wall, whereby the flame will burn at the extreme outer end of the nozzle.

Moreover, the pilot light is so designed that the constantly burning light is close to the ignition port fitting of the gas burner.

Furthermore, the device is readily adaptable to a central pilot gas supply serving a plurality of pilot burners, each pilot being hooded so as to protect the flame.

Moreover, the device is so constructed that the shield and ignition port fitting may be easily and quickly removed from the burner for cleaning.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a fragmentary side elevation of a front gas burner equipped with the invention;

Fig. 1A is a similar view of a different style of gas burner shown in a rear burner position;

Fig. 2 is an enlarged fragmentary sectional elevation of the form of invention shown in Fig. 1;

Fig. 3 is a similar view of the form of invention shown in Fig. 1A;

Fig. 4 is an enlarged plan view of the form shown in Fig. 2;

Fig. 5 is an end elevation of the form of invention shown in Fig. 4 and is taken on line V—V of Fig. 2;

Fig. 6 is an elevation of the same structure viewed from the end opposite from that shown in Fig. 5;

Fig. 7 is a sectional elevation of the form of invention shown in Fig. 3 and is taken on line VII—VII thereof;

Fig. 8 is a bottom fragmentary plan view of the form of invention shown in Fig. 3;

Fig. 9 shows a modified form of the pilot tube;

Fig. 10 is a sectional plan view of a nozzle body formed with nozzle protecting guards; and

Fig. 11 is an end elevation of a modified form of shield similar to that shown in Fig. 5.

In Fig. 1 of the drawings, there is shown a typical gas range installation comprising a front burner **10** and a rear burner **11**. The front burner is carried by a suitable support (not shown) and is supplied with gas mixture through a mixing tube **12** which is connected to the usual burner shut-off valve **13**, which is provided with an actuating handle **14**. The gas supply pipe is represented at **15** and supplies the gas valve **13** for the burner **10** as

well as a similar gas valve (not shown) for the mixing tube **16** of the rear burner **11**.

The front burner **10** is formed with a passage **20** in communication with the mixing tube **12** into which is fitted the stem **21** of an ignition port fitting **22**. The stem **21** may be slightly tapered so as to provide a gas-tight joint which may be easily separated for cleaning. The pilot burner for the front gas burner is carried by the ignition port fitting **22**. A shield **24** is provided for the pilot burner and has its forward end **23** mounted upon the fitting. The end **23** of the shield has a top wall portion **25** at its forward end and two side depending walls **26** which are arranged adjacent to and closely fit the side walls of the ignition port fitting. This fitting is formed with an upstanding boss **30** which is passed through an aperture formed in the top wall portion **25** of the shield and which is provided with a riveted head **31** after assembly, whereby the parts are secured together. The side walls **26** have two opposite offset arms **32** which extend rearwardly and form a part of the shield **24**. The side portions of the shield at the end opposite the ignition port fitting are provided with two inwardly extending arms **33** which are formed at their inner upper ends with arcuate surfaces **34** for engagement with a pilot tube **35**. These arcuate surfaces form an inverted U-shaped recess, whereby the shield may be lifted off of the tube **35** when the gas burner is removed for cleaning. In the form of invention shown in Fig. 11, the inwardly extending arms **75** closely fit the pilot tube **35** around which they are disposed. The pilot tubes are connected to a central T-member **36** which is fed with gas by means of a pilot supply pipe **40** supported by a suitable bracket indicated at **17**. This pipe is suitably connected to the gas supply pipe **15** through a filter **18** which is provided with a pilot adjusting screw **41**.

The pilot burner for the rear burner **11** is formed with an ignition port fitting **42** of slightly different construction. This fitting is provided with a sleeve **43** which is formed preferably with longitudinal serrations and which is pressed into an opening formed in the side wall of the rear burner for permanent attachment thereto. The fitting is formed immediately in front of the wall with an annular groove **44** for the reception of a lateral wall **45** formed at the inner end of the shield **52**. This wall connects and forms a part of the two opposite end walls **46** of the shield. A vertically disposed wall **50** is extended outwardly from each of the walls **46** in spaced relation with each other for contact with flattened surfaces **51** formed on opposite sides of the ignition port fitting. The end walls of the shield are spaced from the body of the shield by means of a top wall portion **53** in which a slot **54** is formed. This shield is formed with two spaced side walls **55** for protecting the pilot light against extinguishing air currents.

The ignition port fitting **22** of Fig. 2 is formed with a vertical aperture **56** in its sleeve portion **21** which communicates with a vertical offset port **60** and a lateral communicating port **61** formed in the fitting, whereby gas mixture supplied to the front burner **10** will pass up through aperture **56** out through ports **60** and **61**. The gas mixture passing through port **61** will be projected toward and ignited by the pilot light, and that passing through port **60** having been ignited will in turn ignite the gas mixture issuing from the burner head **10**.

In similar manner, the sleeve **43** of the ignition port fitting **42** of the form of invention adapted to the rear burner (see Fig. 3) is formed with a central aperture **62** which communicates with a recess **63** from which is extended a lateral port **64** and an axial port **65** which function in a manner similar to that described in connection with the form shown in Fig. 2. The ignition port fittings **22** and **42** are each formed with a slot **66** and a

slot 77, respectively, which connects the ports 60 and 61, 64 and 65, thereof respectively, and tends to induce the upward flow of burning gas mixture toward the respective burner heads. The pilot tube in each form of the invention is so located that the nozzle thereof is either in substantially the same horizontal plane as the axial port of the ignition port fitting or below the same.

The pilot tube 35 of each pilot burner comprises a body part 70, the inner end of which is secured to the T-member 36, whereby it receives gas from the pipe 15 through the supply pipe 40. Each pilot tube is provided with a nozzle 71 having a very small orifice formed therein. The length of the nozzle is many times greater than its diameter, whereby the lifting of the small flame from the nozzle is prevented. The nozzle is carried preferably by a bushing 73 which is pressed into the end of the body part 70. The body part of each tube preferably has a very thin wall and is of such length that it extends into the coacting shield a distance sufficient to protect the constantly burning flame from currents of air which might extinguish it. In Fig. 9, I show a modified form of pilot tube 74 having a body port 75 and an integral nozzle 76 which is formed preferably by swaging.

Since the nozzles of the pilot tubes are very small and have walls of minute thickness, comparable to a hypodermic needle, it is desirable to protect the ends thereof from accidental damage; and to accomplish this, two oppositely disposed arms 80 are provided, one on each side of the nozzle. Each of these arms is preferably formed from the body 70 of the pilot tube and is flared outwardly as shown in Fig. 10 to position the outer ends thereof away from the pilot nozzle 71. These arms project somewhat beyond the end of the nozzle, and prevent the flame of the pilot from burning in the space between the arms and the nozzle.

While I have shown but two range burners, it is obvious that the device is adapted to any number of burners, and when more than two are used, a branch supply pipe (not shown) is connected to the T-member 36 in well known manner, thus conducting gas to the pilot tube of the other burners (not shown).

When the device is to be put into use, gas coming from each of the pilot burner nozzles is ignited and the gas supplied to the nozzles is regulated by means of the adjusting screw 41. Due to the small size of the nozzle opening, the flame is very small, thereby consuming very little gas. Owing to the thinness of the nozzle wall, the flame will be held close to the end of the nozzle and thereby be prevented from blowing away or being extinguished by induction of air across the nozzle. When, now, the valve controlling gas to the mixing tube of the front burner is opened to supply gas to this burner, the mixture will pass up through opening 56 and out through ports 60 and 61 as well as through the slot 66. The gas projected from port 61 will pass under the shield 24 and be ignited by the pilot flame at the end of the nozzle 71. The flame at port 61 will flash back and ignite the gas emitted from orifice 60 and slot 66 which will be projected upwardly toward the gas mixture coming from the burner itself, thereby igniting the same. In like manner, when the back burner is supplied with gas, the resulting mixture will flow through ports 62 and 63 of the ignition port fitting and out through passages 65 and 64 and slot 66. The gas mixture flowing from the passage 65 will be ignited by the flame of the associated pilot nozzle which will simultaneously ignite the gas mixture flowing through passage 64 and slot 66 thereby causing ignition of the gas coming from the burner.

Obviously, since the pilot flames are within the shields of the device, the objectionable center "hot spot" on the range is removed.

Obviously, some modifications of the details herein shown and described may be made without departing from the scope of my invention or the scope of the appended claims; and, it is the wish, therefore, not to be limited to the detail embodiment herein shown and described.

What is claimed is:

1. A pilot burner device including a substantially horizontally disposed shield means defining a closed upper surface and a pair of depending side walls defining a cavity, a substantially horizontally disposed tubular body part extending into said cavity, said tubular body part having a closed end portion, a tubular nozzle projecting forwardly of said closed end portion and extending through said closed end portion and being in communication with the interior of said body part, said nozzle being of elongated configuration and having a wall of minute thickness, the length of said nozzle being at least ten times as great as the inner diameter thereof whereby the pilot flame will burn at the extreme outer end of the nozzle, the inner diameter of said nozzle being many times less than the inner diameter of said body part, a plurality of arms extending from the outer end of said body part adjacent said nozzle, said arms extending on opposite sides of said nozzle and projecting forwardly beyond the outer end of the nozzle, said arms flaring outwardly in a forward direction, the free outer ends of said arms being spaced from said shield whereby the end of the nozzle is effectively protected from accidental damage, a source of gas connected to said body part, and ignition port means in spaced relation with said nozzle, said ignition port means being provided with ports, means providing communication between said ports and a source of gas, at least one of said ports being disposed adjacent to and opening toward said shield means for directing a stream of gas within the cavity defined by said shield, said nozzle being disposed in substantially the same horizontal plane as said last-mentioned port for insuring ignition of a stream of gas issuing from said port by the pilot flame at the end portion of said nozzle.

2. Apparatus as defined in claim 1, including a gas burner, said ignition port means being disposed adjacent to and below the top surface of said burner, said ports including offset interconnected ports, one of said ports extending vertically for directing a stream of gas upwardly toward said burner.

3. Apparatus as defined in claim 1, wherein said nozzle is mounted coaxially with said body part, the inner diameter of said nozzle being approximately .023 inch, and said nozzle having a wall thickness of approximately .006 inch.

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