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RUNNER LIGHTER FOR GAS BURNERS

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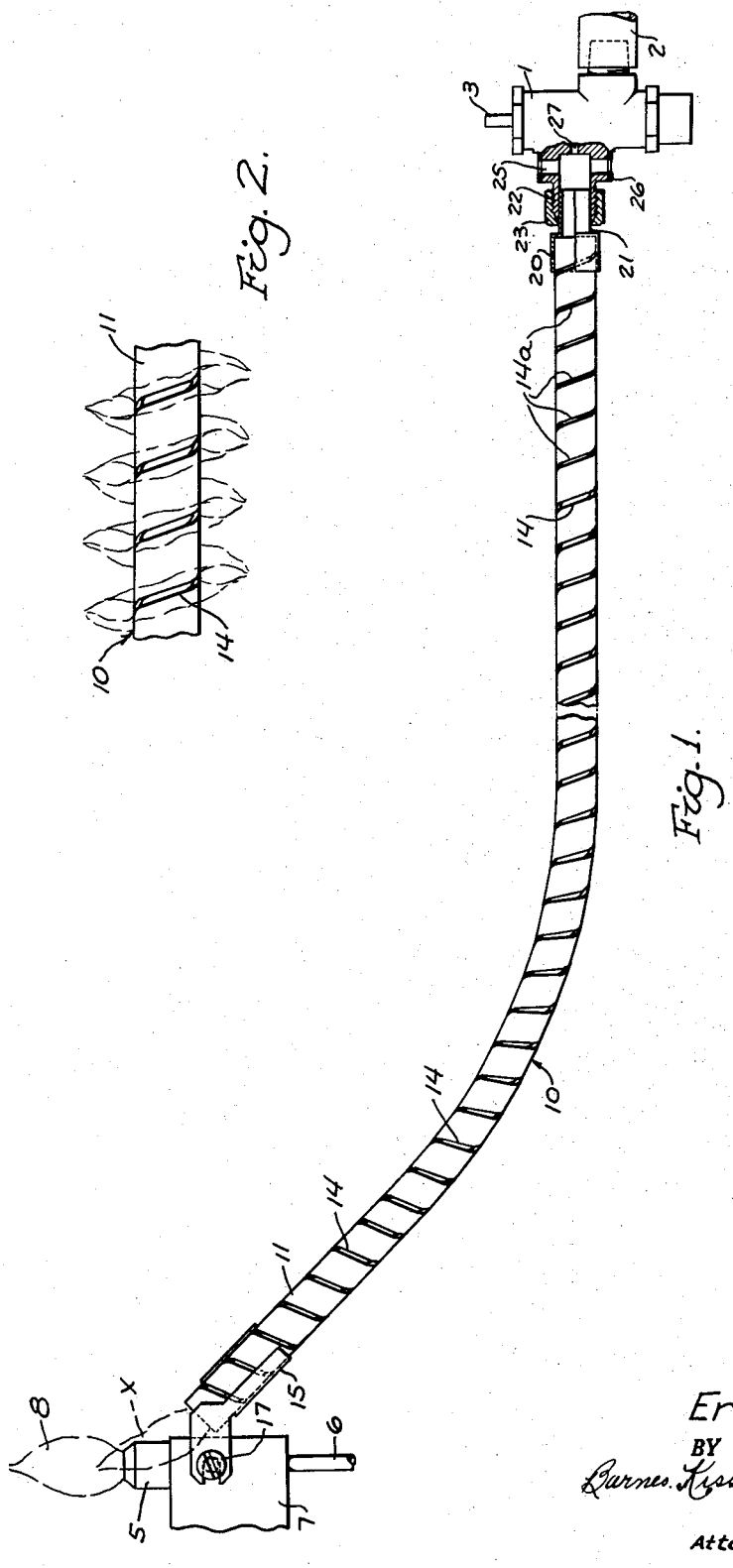


Fig. 2.

Fig. 1.

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RUNNER LIGHTER FOR GAS BURNERS

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2 Claims. (Cl. 158—115)

This invention has to do with a lighter construction for igniting gas issuing from a burner, and it relates particularly to a runner lighter structure for igniting gas issuing from a burner which is relatively inaccessible or remote as regards the person or operator.

In gas burning equipment a gas burner is sometimes positioned so that access thereto is difficult. For example, in gas burning furnaces, the burner usually is housed well within the structure of the furnace and cannot be easily reached. Usually there is a pilot burner for the main gas burner or burners, and the pilot burner is also relatively remote and difficult to reach for lighting purposes. In other gas burning equipment such, for example, as an oven of a domestic gas range, the burner or burners therein may be inaccessible and relatively remote.

The principal object of the present invention is to provide an improved runner lighter structure for igniting the gas issuing from relatively remote or inaccessible burners. A runner lighter structure is a device to which gas may be introduced and an igniting flame applied thereto and the flame travels or chains along the length of the runner lighter structure. Thus, a runner lighter may be somewhat in the nature of a tube, arranged so that the igniting flame may be applied thereto adjacent one end, and the resulting flame travels along the same and ignites gas issuing from a burner adjacent the opposite end.

The object of the invention, more particularly, is to provide an improved flexible runner lighter structure which can be easily installed and shaped or flexed or fashioned around interfering mechanical parts. The runner lighter structure of the present invention can be easily and readily manufactured, and because of its flexibility, does not have to be tailored or shaped or formed into any particular configuration to fit specific installations. A flexible runner lighter of the present invention may be used in many installations and because of its flexibility it may be flexed and shaped as needed. It can be used with burners which are not particularly remote or inaccessible.

In the drawings:

Fig. 1 is a general assembly view with parts cut away and some parts in section showing a runner lighter structure of the present invention assembled with a gas controlling valve and a burner.

Fig. 2 is a view showing a portion of the runner lighter structure and illustrating the nature of the flame which progresses along the same.

In Fig. 1 there is a gas controlling valve 1 to which gas is supplied from a conduit or the like 2. This valve is normally closed and may be opened for the passage of gas therethrough by means of depressing a finger piece 3. A burner is illustrated at 5 to which gas may be supplied through a pipe 6. The burner may be supported by a suitable bracket 7. This particular burner, as indicated, is a pilot burner.

The pilot burner may sit in close proximity to a main

heating burner so that when gas is supplied to the main burner it is ignited by the pilot flame which is indicated at 8, but it makes no difference what kind of a burner is to be ignited.

The runner structure is of simple and effective formation. It comprises essentially a tubular form fashioned from a helically wound length of material. The material of which the tubular form is made should be capable of resisting the flame or heat encountered and is preferably of metal. The length of material is preferably of strip or ribbon form as indicated although other shapes of material may be employed. This tubular form is generally illustrated at 10 and is composed of a multiplicity of convolutions, indicated at 11, of helically formed material. The convolutions are spaced apart so that while there is a tubular form presented there is also a helical slot or opening running the length of the tubular form. The slot or opening is indicated at 14.

One end of the tubular form is provided with a suitable fitting such as a clip 15 which engages the end of the tubular structure, so as to preferably leave a portion of the helical slot exposed, as indicated, and the clip is provided with a tongue 16 which may be secured to the bracket 7 by a screw 17.

A fitting at the opposite end of the tube is in the form of a ferrule having a portion 20 fitting over and secured to the end of the tubular structure and a portion 21 arranged to be disposed within an extension 22 on the valve body and secured thereto by a compression fitting 23. The valve is provided with one or more openings 25 which can be regulated or throttled by a rotatable ring 26 for the entrance of air. The valve is provided with a small port or jet opening 27 through which the gas passes as it flows into the ferrule and into the end of the tubular structure of the lighter. The jet of gas issuing from the port 27 aids in producing a venturi action drawing in air through the ports 25. This may be considered as primary air.

The tubular structure, while being described as a helix, or of helical form, need not necessarily be of circular form in cross section, although the circular form is probably the most convenient form. The convolutions are spaced apart to provide a helical slot of requisite width. However, at the location adjacent the valve 1 the convolutions may be a little closer together so that the helical slots 14*a* are relatively narrow.

In use, the runner lighter is mounted as indicated in Fig. 1. Valve 1 is located in an accessible place and can be, for example, near or just outside of a wall or door of a furnace. The flexible tubular body passes into the structure of the furnace and its opposite end, as indicated in the drawings, is in igniting proximity with a burner.

To light the burner an operator depresses the finger piece 3, so that gas is projected into the tubular form. A flame of a match or other device may then be applied to the tubular form at any place along its length. Usually however, the flame is applied adjacent the valve body 1 and near the narrow slots 14*a*. This ignites gas issuing from the slots. Inasmuch as the slots 14*a* are relatively narrow, the resultant immediate flame or flash of ignition is relatively small to thus minimize or eliminate the possibility of the flame burning the hand of the operator.

When the valve 1 is first opened, it will be appreciated that the tubular structure may be full of air and the jet of gas which is projected into the end of the tubular structure mixes with this air. Furthermore, the jet of gas draws in primary air through the ports 25 and thus a combustible mixture is provided. The velocity of the jet causes a flow of the combustible mixture through the tubular structure. Some escapes through the opening. When a flame is applied to the exterior of the tubular structure, for example, adjacent the valve 1, the com-

bustible mixture is ignited at the opening or openings. The flame travels rapidly the length of the tubular structure and a tongue of flame may project from the opposite end of the tubular structure, as indicated at *x*, to ignite the gas flowing from the burner 5.

This travel of the flame along the length of the flexible structure may occur by reason of the flame following helically along the helical slot, although it may and can occur, by reason of the flame jumping across the width of the material from one convolution to another. The travel may be due sometimes to both these actions. The traveling action of the flame is rapid. However, the continuous slot is not essential to ignition, as portions of the slot may be covered, as would be the case if the tubular structure be placed alongside and in contact with some structural element. In this case, the flame may "chain," so to speak, jumping from one convolution of one slot to the next convolution across the width of the strip. The continuous separated convolutions, however, facilitate a high degree of flexibility.

When primary air is drawn into the tubular structure, a combustible mixture is provided which makes for a blue flame, and for the projection of the combustible mixture and flame for a considerable distance. However, if the length of the structure is not too great, the introduction of primary air may be dispensed with. Furthermore, if the pressure of the gas is sufficiently high, the lighter will operate over a reasonably long distance without primary air. The width of the helical slot may vary considerably but this depends somewhat upon the pressure of the gas. The slot must not be too wide for low pressure gas and, therefore, it is preferable to select an optimum slot size for universal use. Within limits, the helical tubular structure may be stretched or extended.

It will be noted that a particularly flexible structure is provided. The structure may be curved, flexed or fashioned around structural elements and other portions of equipment which may normally lie in the path between the valve and the burner. The tubular structure may also be easily cut to length.

The invention, of course, is not limited to any particular dimensions or to materials. However, strip steel stock, somewhat of ribbon form, has been found to be satisfactory. The pitch of the helix may be varied and may be selected with due consideration to the material involved and the flexibility desired. As a further example, structures involving the following dimensions have ben found to be satisfactory:

(1) 32" overall length; strip ½" wide; interior diameter 7/16"; width of slot 5/64"; width of slot for 5 convolutions near the valve 1/32".

(2) 32" overall length; width of strip ¼"; interior diameter of tubular structure ⅜"; width of slot .050"; width of slot for 8 convolutions near the valve .025".

(3) Overall length 32"; width of strip 5/16"; interior diameter of tubular structure ⅜"; width of slot .050"; width of slot for 6 convolutions near the valve .025".

I claim:

1. A lighter device for the purposes described comprising, a length of material fashioned into a helix to provide an elongated flexible tubular structure adapted to receive gas, the convolutions of the helix being spaced apart so that the edges of the metal strip define an opening along the length of the tubular structure for the escape of gas the convolutions being such that the tubular structure will conduct gas from one end to the other, the spacing of the convolutions of the helix adjacent one end thereof being less than the spacing throughout the major portion of the length of the tubular structure to provide a relatively narrow helical opening, whereby to reduce the size of the resultant flame at the narrow opening when the gas issuing therefrom is ignited.

2. A lighter device for the purposes described comprising, a strip of metal fashioned into a helix to provide an elongated flexible tubular structure capable of being fashioned into one or more curves, the convolutions of the helix being spaced apart so that the edges of the metal strip define a helical opening along the length of the tubular structure, means on one end of the tubular structure for mounting the same adjacent a burner, means on the other end of the tubular structure for mounting the same adjacent an element for supplying fuel gas into the tubular structure, several convolutions adjacent said opposite end of said tubular structure being relatively closely spaced to provide a relatively narrow helical opening, whereby the resultant flame of ignited gas at said narrow helical opening is relatively small.

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