March 17, 1959 J. T. ALGER 2,877,837

FLAME DEFLECTOR

Filed April 15, 1957

FIG. 1

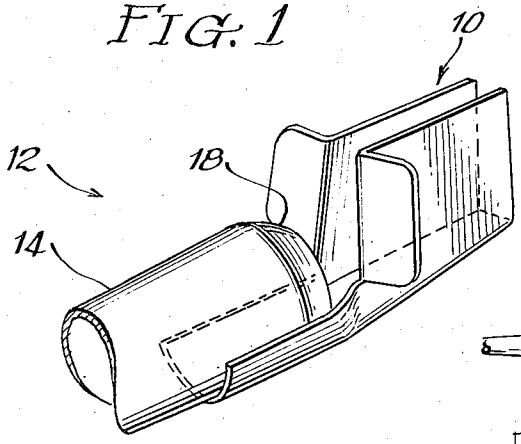


FIG. 2

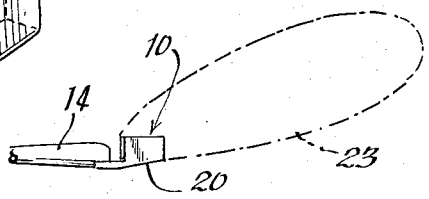


FIG. 3

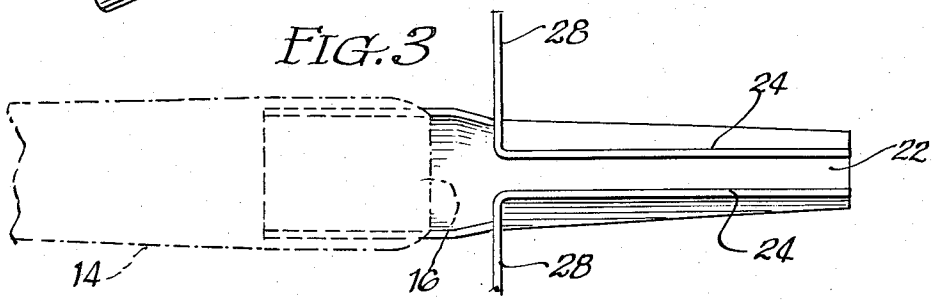


FIG. 4

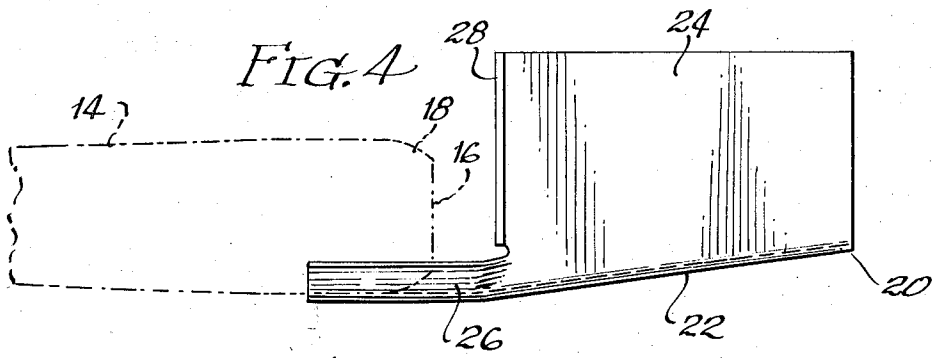
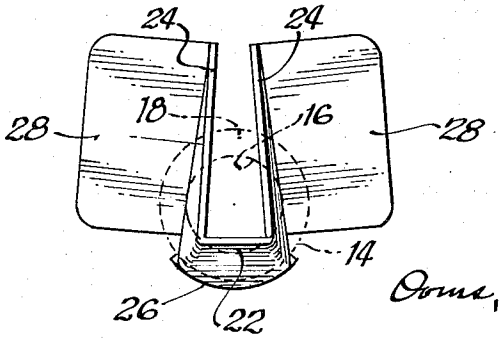


FIG. 5



INVENTOR.
Jerry T. Alger

BY
Ooms, McDougall, Williamson & Hersh
Attorneys

United States Patent Office 2,877,837 Patented Mar. 17, 1959

2,877,837

FLAME DEFLECTOR

Jerry T. Alger, Chicago, Ill., assignor to Configured Tube Products Co., a corporation of Illinois

Application April 15, 1957, Serial No. 652,901

7 Claims. (Cl. 158—113)

This invention relates to flame spreaders or deflectors for use on gas burners, such as may be employed in clothes dryers, furnaces, or other gas appliances.

One object of the present invention is to provide a new improved flame deflector which will produce a fairly long, narrow, compact flame that will be advantageous in various gas appliances.

Another object is to provide a new and improved flame deflector having means for producing small retaining flames extending laterally from the base of the main flame.

A further object is to provide new and improved flame deflectors that may be employed on a series of burners arranged in parallel, spaced relation, so that the entire series of burners will become lighted in sequence, if the first burner in the series is ignited.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings in which:

Fig. 1 is a perspective view showing a burner equipped with a flame deflector that will be described as an illustrative embodiment of the present invention.

Fig. 2 is a small scale elevational view of the flame deflector, showing the pattern of the flame produced by the burner, when operating without forced draft.

Fig. 3 is a top view of the flame deflector.

Fig. 4 is the side elevational view of the deflector.

Fig. 5 is a front or end view of the flame deflector.

It will be seen that Fig. 1 illustrates a flame deflector or spreader **10** for use in connection with a gas burner **12**, which may be of a known type having a mixture tube **14** adapted to receive gaseous fuel and air, and to discharge a mixture of the fuel and air through a port **16** in the end of the mixture tube **14**. In this case, the mixture tube **14** is horizontally directed and is formed with an annular flange **18** turned inwardly at an acute angle around the burner port **16**.

The illustrated flame deflector **10** has a body portion **20** which is generally channel-shaped. Thus, the body **20** is formed with a bottom deflector wall **22** with a pair of spaced sidewalls or flanges **24** extending upwardly or laterally therefrom. In this case, the deflector wall **22** is positioned at the bottom of the flame deflector body **20**, and is inclined upwardly at a small angle, so as to form an upwardly deflected main flame **24**, but the deflector wall **22** might be varied in position so as to deflect the flame laterally or in some other direction.

The side walls **24** are quite closely spaced, with respect to the length of the flame deflector body **20**. Thus, the bottom deflector wall **22** is narrow and quite elongated.

As shown, the side walls **24** are bent toward each other so that they converge upwardly. In other words, the space between the sidewalls **24** tapers upwardly. The height of the illustrated sidewalls **23** is relatively great with respect to the space between the sidewalls.

The result of this arrangement of the flame deflector body **20** is to produce a main flame **23** which is deflected upwardly and spread out vertically so as to be wide when viewed in elevation as in Fig. 2, the flame being quite

narrow and compact when viewed from the top. The height, length and upward convergence of the sidewalls **24** regulate the length, width and the thickness of the flame. The inclination of the bottom deflector wall **22** may be varied to change the upward inclination of the flame.

It will be seen that the flame deflector body **20** is positioned directly in front of the burner port **16**, and is spaced upwardly from the port by a mounting portion or leg **26** which extends between the body **20** and the burner tube **14**. As illustrated, the mounting leg **24** is formed integrally with the deflector body **20**, and is arranged to form a continuation of the bottom wall **22** and portions of the sidewall flanges **24**. The inner end of the mounting leg **26** may be welded or otherwise secured to the under side of the burner tube **14**.

In order to form small stabilizing or retaining flames at the base of the main flame **23**, the deflector body **20** is provided with a pair of wings or ears **28** which project laterally from the inner ends of the sidewall flanges **24**. Thus, the ears **28** extend in opposite horizontal directions from the sidewalls **24**.

The effect of the ears or wings **28** is to pick up and deflect small portions of the fuel and air mixture in lateral directions, so as to form small laterally directed flames adjacent to the base of the main flame **23**. These small flames have a stabilizing effect on the main flame and thus tend to prevent the main flame from being blown out. The ears **28** are shown as being bent outwardly at right angles from the sidewalls **24**, but this angle may be varied to change the shape and size of the retaining flames. Thus, the ears **28** may be bent inwardly, toward the burner tube **14**, so as to reduce the size of the retaining flames.

Because of the lateral deflection of the fuel air mixture, a series of burners like that shown in Fig. 1 may be mounted side by side in a horizontal series. All of them may be lighted by lighting the first burner in the series. The burners will light in sequence due to the formation of the laterally extending retaining flames on each burner. This characteristic of the flame deflector is highly advantageous where it is necessary or desirable to use two or more burners in a gas appliance.

It will be noted that the height of the side flanges **24** is considerably greater than the diameter of the mixture tube **14** so that the flanges definitely tend to confine the mixture as it is deflected upwardly by the inclined lower wall **22**. As illustrated, the lower wall **22** is tapered outwardly and the sidewall flanges **24** are slightly convergent in an outward direction. This tends to have a narrowing effect upon the flame.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description, and defined in the following claims.

I claim:

1. In a burner, the combination comprising a horizontal mixture tube having an axial discharge port at one end, a flame deflector mounted on the end of said mixture tube and having a body spaced outwardly in front of said port, said body being generally channel-shaped and extending generally longitudinally with respect to the axis of said port, said body having a long, narrow bottom wall sloping upwardly in an outward direction for causing an upward deflection of the combustible mixture discharged from said port, said body having spaced left and right-hand sidewall flanges extending in a generally upward direction from said bottom wall and bent toward each other so as to converge upwardly, said sidewall flanges being greater in height than the spacing therebetween and being greater in vertical extent than the mixture tube, a pair of gen-

erally vertical ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, said ears being near the discharge port but spaced in front thereof, said ears overlapping opposite side portions of said port and thereby being in the path of mixture discharged therefrom, and a mounting leg extending between said bottom wall and said mixture tube, said mounting leg being secured to said mixture tube to support said flame deflector thereon.

2. In a burner, the combination comprising a horizontal mixture tube having an axial discharge port at one end, a flame deflector mounted on the end of said mixture tube and having a body spaced outwardly in front of said port, said body being generally channel-shaped and extending generally longitudinally with respect to the axis of said port, said body having a long, narrow bottom wall sloping upwardly in an outward direction for causing an upward deflection of the combustible mixture discharged from said port, said body having spaced left and right-hand sidewall flanges extending in a generally upward direction from said bottom wall, said sidewall flanges being greater in height than the spacing therebetween and being greater in vertical extent than the mixture tube, left and right-hand generally vertical ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, said ears being near the discharge port but spaced in front thereof, said ears overlapping opposite side portions of said port and thereby being in the path of mixture discharged therefrom, and a mounting portion extending between said bottom wall and said mixture tube, said mounting portion being secured to said mixture tube to support said flame deflector thereon.

3. In a burner, the combination comprising a mixture tube having an axial discharge port at one end thereof, a flame deflector mounted on said end of said mixture tube and having a body spaced outwardly in front of said port, said body being generally channel-shaped and extending generally longitudinally with respect to the axis of said port, said body having a long narrow generally longitudinal deflector wall extending outwardly and slanting at a small angle from a point in front of one side portion of said burner tube in a direction toward a point in front of the opposite side portion of said burner tube, said deflector and wall thereby slanting into the path of the mixture from said port to deflect the mixture in said direction, said body having spaced left and right-hand generally longitudinal sidewall flanges extending generally in said direction from said deflector wall and bent toward each other so as to converge in said direction, said sidewall flanges being greater in extent in said direction than the spacing therebetween and being greater in extent in said direction than the diameter of said mixture tube, left and right-hand ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, said ears extending generally transversely to the axis of said discharge port and being near said port but spaced in front thereof, said ears overlapping opposite side portions of said port and thereby being in the path of mixture discharged therefrom, and a mounting portion extending between said deflector wall and said mixture tube and being secured thereto to support said flame deflector thereon.

4. In a burner, the combination comprising a horizontal mixture tube having an axial discharge port at one end, a flame deflector mounted on the end of said mixture tube and having a body spaced outwardly in front of said port, said body being generally channel-shaped and extending generally longitudinally with respect to the axis of said port, said body having a long, narrow bottom wall sloping upwardly in an outward direction for causing an upward deflection of the combustible mixture discharged from said port, said body having spaced left and right-hand sidewall flanges extending in a generally upward direction from said bottom wall, the height of said sidewall flanges being greater than the diameter of said discharge port, the spacing between said sidewall flanges being substantially less than the diameter of said discharge port, generally vertical ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, said ears being near the discharge port but spaced in front thereof, said ears overlapping opposite side portions of said port and thereby being in the path of mixture discharged therefrom, and a mounting portion extending between said bottom wall and said mixture tube, said mounting portion being secured to said mixture tube to support said flame deflector thereon.

5. A flame deflector for use on a generally horizontal burner tube with an axial discharge port, said flame deflector comprising a body adapted to be mounted on the end of the burner tube in front of the port in outwardly spaced relation thereto, said body being generally channel-shaped and having a long narrow generally longitudinal bottom wall sloping upwardly in an outward direction for causing an upward deflection of the combustible mixture discharged from the port, said body having spaced generally longitudinal left and right-hand sidewall flanges extending in a generally upward direction from said bottom wall and bent toward each other so as to converge upwardly, said sidewall flanges being greater in height than the spacing therebetween, left and right-hand generally vertical ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, and a mounting leg extending rearwardly from said bottom wall and adapted to be secured to the burner tube to support the flame deflector thereon.

6. A flame deflector for use on a generally horizontal burner tube with an axial discharge port, said flame deflector comprising a body adapted to be mounted on the end of the burner tube in front of the port in outwardly spaced relation thereto, said body being generally channel-shaped and having a long narrow generally longitudinal bottom wall sloping upwardly in an outward direction for causing an upward deflection of the combustible mixture discharged from the port, said body having spaced generally longitudinal left and right-hand sidewall flanges extending in a generally upward direction from said bottom wall, said sidewall flanges being greater in height than the spacing therebetween, left and right-hand generally vertical ears formed laterally away from each other in opposite directions from said respective left and right-hand sidewall flanges at the inner ends thereof, and a mounting portion extending rearwardly from said bottom wall and adapted to be secured to the burner tube to support the flame deflector thereon.

7. A flame deflector for use on a burner tube with an axial discharge port, said flame deflector comprising a body adapted to be mounted on the burner tube in front of the port and in outwardly spaced relation thereto, said body being generally channel-shaped and having a long narrow generally longitudinal deflector wall extending outwardly and slanting transversely in one direction at a small angle for causing deflection in said direction of the combustible mixture discharged from the port, said body having spaced generally longitudinal left and right-hand sidewall flanges extending generally in said direction from said deflector wall, said sidewall flanges being greater in extent in said direction than the spacing therebetween, left and right-hand ears formed laterally away from each other in opposite directions from said respec-

tive left and right-hand sidewall flanges at the inner ends thereof, said ears extending generally transversely with respect to the longitudinal direction of said sidewall flanges, and a mounting portion extending inwardly from said deflector wall and adapted to be secured to the burner tube to support the flame deflector thereon.

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