

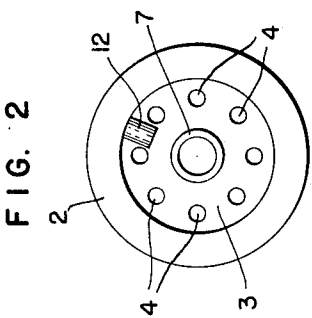
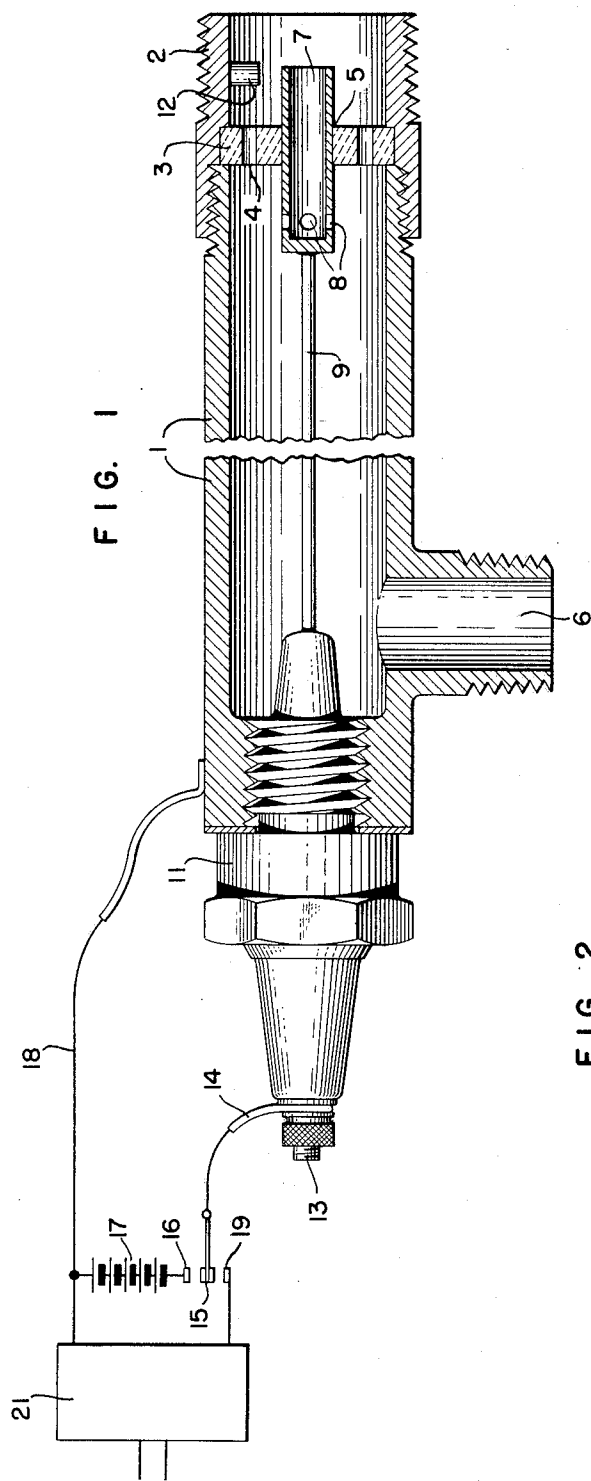
Aug. 15, 1961

J. R. WILLIAMS

2,996,113

BURNER

Filed July 10, 1957



INVENTOR.
JOHN ROGER WILLIAMS
BY *E. Welford Mason*

ATTORNEY.

1

2,996,113
BURNER

John Roger Williams, Ambler, Pa., assignor to Selas Corporation of America, Dresher, Pa., a corporation of Pennsylvania

Filed July 10, 1957, Ser. No. 670,950
4 Claims. (Cl. 158-115)

The present invention relates to burners, and more particularly to a gas burner of the torch type that includes provisions for ignition and flame failure as a part thereof.

In many burners it is required, for reasons of convenience, that the burner be provided with means whereby it may be ignited from a remote point. It is also frequently required, for reasons of safety, that the burner be provided with means to detect when the flame is extinguished. The incorporation of these means in a burner has frequently entailed a complex arrangement of parts in a relatively small space.

It is an object of this invention to provide a gas burner in which there are provided means to ignite the burner electrically, and means to detect the presence of flame. It is a further object of the invention to provide a torch type burner having piloting means that are ignited to ignite the main flame.

The present burner is adapted to be extended through the wall of an enclosure of any thickness, and occupies a small space. For this reason it is particularly adapted to be used as a pilot burner in large furnaces and in conjunction with other burners to ignite them when they are placed in inaccessible locations.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects attained with its use, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a section through the burner and includes a diagrammatic wiring arrangement for electrical ignition and flame failure detection, and

FIGURE 2 is an end view of the burner.

Referring to the drawings, there is shown a casing for the burner consisting of an elongated cylindrical metal body 1 and a collar 2 threaded to the end of the body. The body and collar serve to support and positively to locate adjacent to the end of the casing, a ceramic burner screen 3 that is provided with a ring of small pilot opening 4 and a relatively large main burner port 5. The body is provided with an inlet 6 through which a combustible mixture of gas and air is supplied to be discharged through the openings 4 and 5.

A tubular metal member 7 forms the port for the main burner flame and is received in the opening 5 of the screen. This member is provided with openings 8 at its rear end through which the mixture can flow to be discharged from the open outer end as a jet of definite size and direction. It is noted that collar 2 forms a wall that surrounds and protects pilot flames which are supplied through the openings 4 and that this collar extends a slight distance beyond the end of the main burner port member 7.

Port member 7 is held in place in screen 3 and is positively located axially with respect thereto by means of a rod 9 that is fastened to its rear end, and which rod extends to and through a porcelain insulating member 11 that is threaded into the back end of the body 1.

The casing of the burner and the tubular member 7 form elements of two electrical circuits, one of which is

2

used to provide a spark to ignite the burner and the other which is used to provide a flame detecting system. In order to reduce the distance that the spark is required to jump, an electrode 12 extending toward tube 7 is welded or otherwise fastened, to the inner surface of collar 2, as best shown in the drawing. The outer end of rod 9 forms a terminal 13 to which a wire 14 is attached. This wire has on its end a contact 15 that can be moved into engagement with a contact 16 thus completing a circuit through member 7, rod 9, wire 14, contacts 15, 16, a battery 17, and a wire 18, to the casing and electrode 12. The second circuit includes the same elements except that the battery is disconnected by throwing contact 15 in the opposite direction into engagement with a contact 19 that is connected to a standard flame failure device 21.

It is intended that the burner be used either as a burner itself or as a pilot burner to ignite large burners that are placed in industrial furnaces or other apparatus. When used for this latter purpose, it is frequently required that the pilot burner be projected through an opening in a furnace wall to some place that is remote and inaccessible from the exterior of the furnace. The present burner is suitable for uses of this sort because of its small diameter and as it is only necessary to provide a rod 9 and a body 1 of varying lengths to adapt them for varying thicknesses of furnace walls through which they are inserted. The burner of this invention can also be fastened in position by any suitable means. For example, threads can be provided, as shown on the outer end of collar 2, by means of which the burner can be threaded in position, or similar threads could be used at another point along the surface of the body 1. It is obvious that brackets of any required type could be used to hold the burner in position.

In the operation of the burner a combustible mixture of a fuel gas and air is supplied under suitable pressure to the inlet 6, and flows through openings 4 and tubular member 7. Contact 15 is moved into engagement with contact 16 to close the circuit through the battery and thereby providing a spark between electrode 12 and the member 7. This spark will serve to ignite the streams of gas issued through openings 4 to ignite the pilot flames which in turn ignite the main flame at the end of member 7. As soon as the burner is ignited contact 15 will be moved into engagement with contact 19 to include the flame failure device 21 in the circuit. Thereafter, as long as the burner is in operation, the flame can be detected since the space between electrode 12 and member 7 is filled at all times with burning gases forming the pilot flames from ports 4. If for some reason the supply of fuel should be discontinued, apparatus 21 will operate in a conventional manner to prevent fuel from being supplied to the burner until suitable precautions are taken to insure that the fuel will be ignited when it is again supplied.

From the above description, it will be seen that I have provided a burner that can be used by itself or as a pilot for additional burners in which fuel for the main burner flame is supplied through a port of fixed size that is definitely and positively located with respect to the rest of the burner. Furthermore, the arrangement by which the parts of the burner are used both as igniting means and safety control means, there is assured that a flame will be maintained at all times between the electrodes of the safety device circuit so that a positive current flow will be produced to insure reliable operation of the system.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing

3

from the spirit and scope of the invention set forth in the appended claims, and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

What is claimed is:

1. In a burner, the combination of a rigid tubular casing of electrically conducting material, a burner screen of insulating material through which fuel is adapted to flow extending across said casing adjacent to and set back from one end thereof, said screen being provided with a central opening and a plurality of surrounding openings, a tubular member of electrically conducting material having an opening at each end received in said central opening and accurately positioned thereby with the end of said member projecting downstream of said screen and within the end of said casing, means to supply fuel to said casing to flow through said openings and through said member, an electrode attached to the interior of said casing downstream of said screen and substantially opposite the end of said member and extending toward the same, means forming an electrical circuit and including said member and casing and operative to produce a spark between said electrode and member to thereby ignite fuel flowing through said screen, and means including said casing, said member and flame detection means forming a second electric circuit operative to detect the presence of flame at the end of said member.

2. In a burner, an elongated rigid cylindrical casing of electrical conducting material, a disc-shaped refractory ceramic burner screen provided with a central opening and a plurality of smaller openings around said central opening, means to fasten said screen across the interior of said casing adjacent to and set back from one end thereof, a tubular member of electrical conducting material having an opening at each end and being of a size to fit snugly in said central opening, a rod attached to said member, means to mount said rod in said casing and insulate it therefrom, said rod serving to hold said member in a fixed position in said central opening with a portion of said member extending beyond said screen in the direction of but within the end of said casing, means to supply fuel to said casing to be discharged through said member and said smaller openings of said screen, an electrode attached to the inner surface of said casing at a point substantially opposite the end of said member and projecting toward the extending portion of said member, and circuit means including said electrode and said member to produce a spark between them thereby to

4

ignite the fuel flowing through said screen and member.

3. In a burner, the combination of a rigid elongated tubular casing having an open end, a disc of refractory material having a central opening and a plurality of openings surrounding said central opening, means to mount said disc within said casing and spaced from the end thereof, a tubular member being open at each end with the opening at one end extending axially, means to hold said member in a fixed position in said central opening with the axially extending open end of said member between said disc and the open end of said casing, means through which a fuel mixture is supplied to said casing to flow through said member as a long flame and through the surrounding openings in said disc as a plurality of pilot flames, an electrode attached to the inside of said casing at a point substantially radially displaced from said open end of said member and extending inwardly toward the same, and means forming an electric circuit including said electrode and said member.

4. In a burner, the combination of an elongated tubular casing having a rigid metal end, a refractory disc of non-conducting material having a central opening and a plurality of openings surrounding said central opening, means to fasten said disc across the interior of said casing and spaced from one said end, a tubular member having an open end and a rod attached to and extending axially from its other end, said other end having a hole adjacent thereto, means to mount said rod in and insulated from said casing with said member received snugly in the central opening of said disc, said rod being of a length to keep the open end of said member between said disc and said end of said casing, an electrode attached to the interior of said end of said casing and extending radially inward thereof toward said member, said electrode being located axially along said end of said casing substantially opposite said open end of said member, and means through which a fuel can be supplied to the interior of said casing to flow through said member and the openings of said disc toward the said end of said casing.

References Cited in the file of this patent

UNITED STATES PATENTS

2,013,979	Bray	Sept. 10, 1935
2,152,790	Clark	Apr. 4, 1939
2,241,295	Clark	May 6, 1941
2,412,655	Shannon	Dec. 17, 1946