Sept. 10, 1946. W. M. SHAW 2,407,349

AIR-COOLED GAS BURNER

Filed Oct. 21, 1944

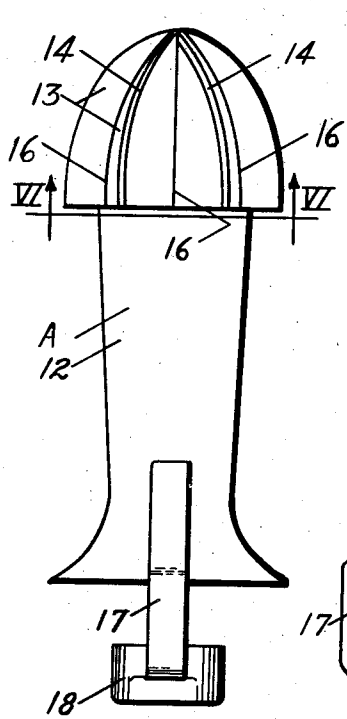


FIG. 1

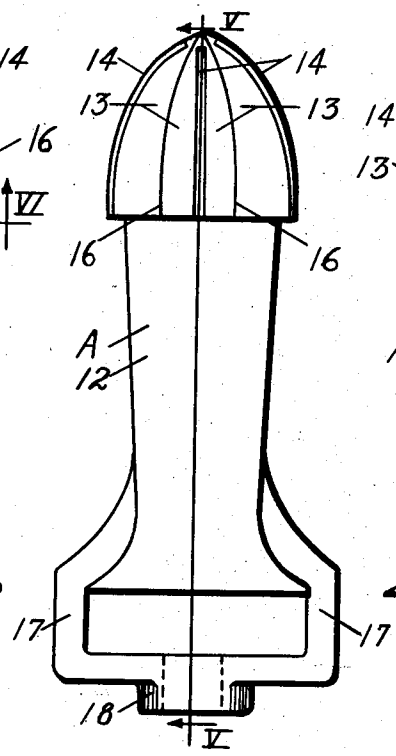


FIG. 2

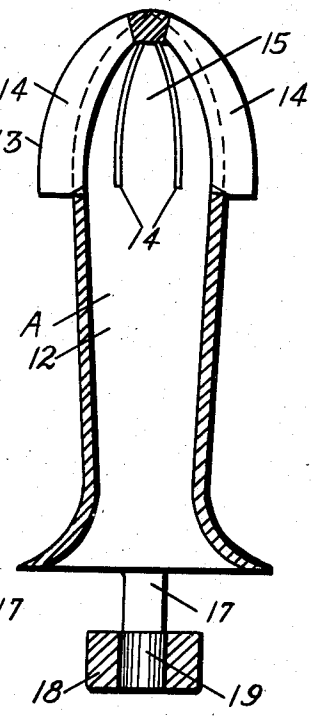


FIG. 5

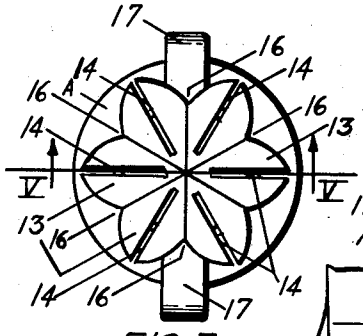


FIG. 3

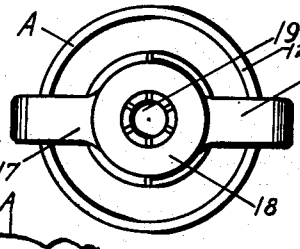


FIG. 4

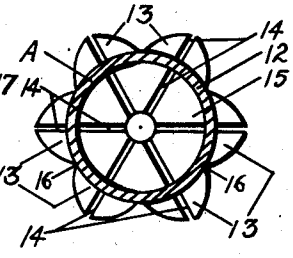


FIG 6

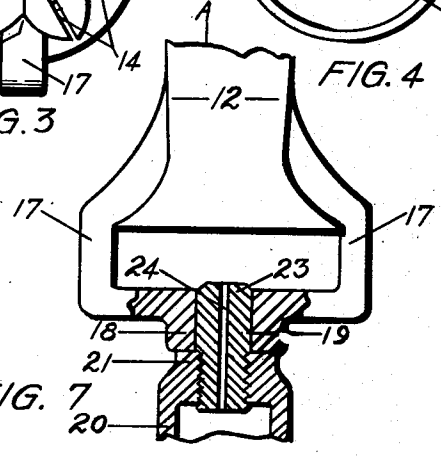


FIG. 7

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AIR-COOLED GAS BURNER

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Application October 21, 1944, Serial No. 559,773

1 Claim. (Cl. 158—99)

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My invention relates to an improvement in gas burners. The object of my invention is to provide a gas burner unit that is small and so designed as to admit the passage of secondary air thereby in such a manner as to act as a cooling medium for the unit so as to prevent the melting of the metal of the unit by the heat of the flame of the burner unit.

A further object is to provide a gas burner unit of the kind mentioned that is provided with extremely deep and narrow slots through which the gaseous fuel may be emitted.

A still further object is to provide a gas burner unit that is small so that a large composite burner may be assembled from the small units and thereby obtain a large and highly efficient burner.

A still further object is to provide a burner of the kind mentioned in which the ports are comparatively small and are therefore light and easy to handle as well as inexpensive to make.

These and other objects will be more fully explained as this description progresses. Now referring to the accompanying drawing;

Fig. 1 is a front view of one of the gas burner elements.

Fig. 2 is a side view of one of the gas burner elements shown in Fig. 1.

Fig. 3 is a top plan view of the burner element shown in Fig. 1.

Fig. 4 is a bottom plan view of the gas burner element as shown in Fig. 2.

Fig. 5 is a vertical detail sectional view through the gas burner unit, the view being taken along the line V—V in Fig. 3 and looking in the direction of the arrows.

Fig. 6 is a horizontal detail sectional view through the gas burner unit, the view being taken along the line VI—VI in Fig. 1 and looking in the direction of the arrows.

Fig. 7 is a detail view, partly in section, showing the method of mounting the gas burner unit on a fuel manifold and also showing the jet for feeding fuel to the gas burner unit.

Similar numerals of reference designate the same parts throughout the several figures of the drawing.

In the drawing is shown a gas burner unit A which comprises a Venturi tube portion 12 having a burner head portion integrally formed on the upper end thereof. The burner head comprises a plurality of curved fin-like elements 13, the lower ends of which project outwardly from the Venturi tube and extend upwardly with the upper portions thereof curving toward and meeting on the center vertical axis of the Venturi tube.

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Each fin-like portion 13 is provided with a deep narrow slot 14 reaching from the outer extremity of the fin 13 to and opening into the cavity 15 of the burner head which is a continuation of the Venturi tube 12, the slots 14 running length ways of their respective fin-like element 13. The size, shape and position of the fin-like elements 13 are such that groove-like formations 16 occur between the fin-like elements.

The lower end of the Venturi tube 12 is provided with a depending yoke-like element 17, that has a centrally positioned enlarged portion 18 which is provided with a hole 19 that is positioned on the vertical center axis of the gas burner unit for purposes that will later be made obvious.

In Fig. 7 is shown a sectional view of a fuel manifold designed for use with the foregoing described gas burner unit. The manifold 20 has boss elements 21 therein that are each provided with a hole 22, the wall of which is threaded so as to receive a threaded jet element 23 that is provided with a small gas feed passage 24.

The gas burner units are assembled on the manifold by holding the units A in a vertical position and then moving them downwardly so that the jet 23 enters the hole 19 of the burner A and fits snugly therein and the enlarged portion 18 of the yoke 17 rests solidly on and is supported by the boss 21 of the manifold so as to build up a composite gas burner device of the kind suggested.

It is obvious from the foregoing description and the showing made in the drawing that small burners consisting of a single burner unit or large burners of almost unlimited size can be built up from suitable manifold sections and burner units as desired.

The operation of the burner is as follows; Gas fuel is fed through gas manifold 20 and then out through the jet passages 24 and is jetted into the Venturi tubes 12 on the center axis thereof whereupon air is also drawn into the Venturi tube and mixed therein with the gas to form a combustible fuel which is emitted therefrom through the burner slots 14 whereupon secondary air flows along the outside grooves 16 of the burner head which tends to cool the burner head and finally joins the fuel being emitted from the burner slots 14 at approximately the point of combustion. The heads are kept cool enough due to the air flow therealong, that the metal thereof does not melt, therefore the life of the burner is long and the burner always remains in good condition.

While I have shown and described what is probably the preferred form of my improved gas

burner device, it is to be understood that such modifications of the burners may be employed as lie within the scope of the appended claims without departing from the spirit and intention of my invention. Now having fully shown and described my invention, what I claim is:

In a gas burner of the class described; a burner unit, said burner unit having a Venturi tube, a hollow elongated gas burner head integrally formed on the upper end of the tube, said gas burner head comprising a series of integral, vertically elongated, curved fins having enlarged base portions and relatively thin outer edges radially positioned around the upper end of the Venturi tube, the lower ends of the fins being positioned substantially vertical and the upper portions of the fins gradually curving toward each

other and meeting each other at a point on the vertical central axis of the burner unit, each of said fins having long deep and narrow slots extending inwardly through said thin edges and through the thickest dimension of the fins substantially throughout their length to a point just short of the meeting point of said fins, said slots communicating with the interior of the Venturi tube to form ports, said fins having their side walls curved convexly from their base toward their thin edges the valley between opposing fins being a continuation of the outer wall of the Venturi tube, whereby uninterrupted stream line flow of cooling secondary air is provided adjacent said ports, and means for entering air and gas fuel into the Venturi tube at its lower end.

WALTER M. SHAW.