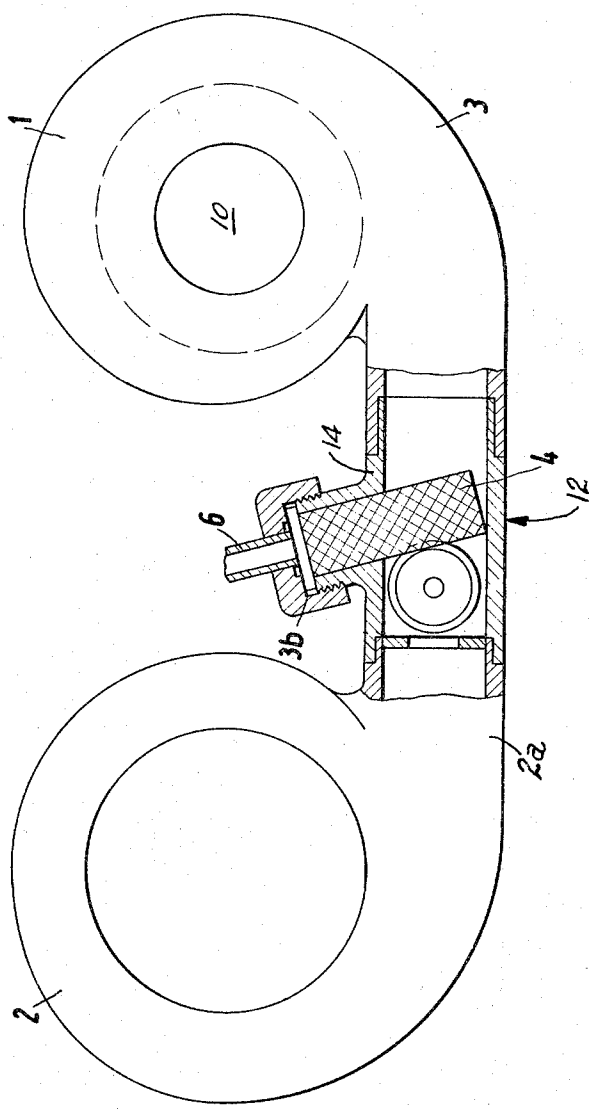
May 23, 1967 S. KOFINK 3,320,997

COMBUSTION DEVICE WITH PRE-COMBUSTION CHAMBER

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Fig. 1



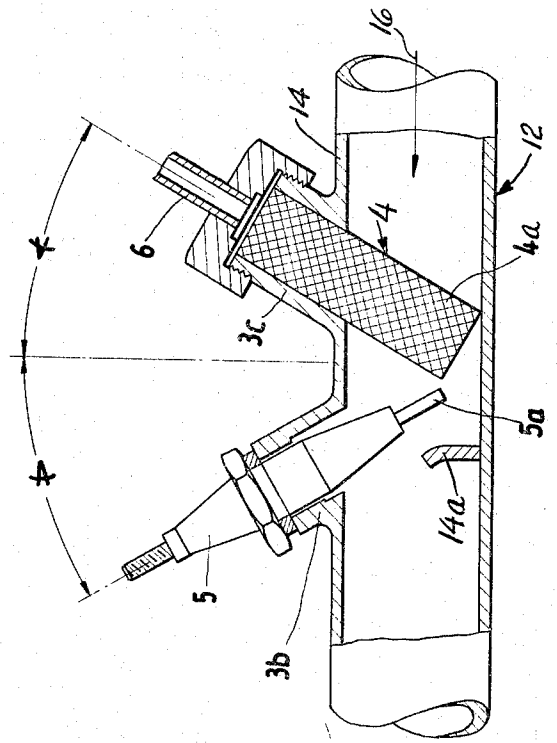
Inventor:
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COMBUSTION DEVICE WITH PRE-COMBUSTION CHAMBER

Filed Nov. 17, 1965 3 Sheets-Sheet 2

Fig. 2



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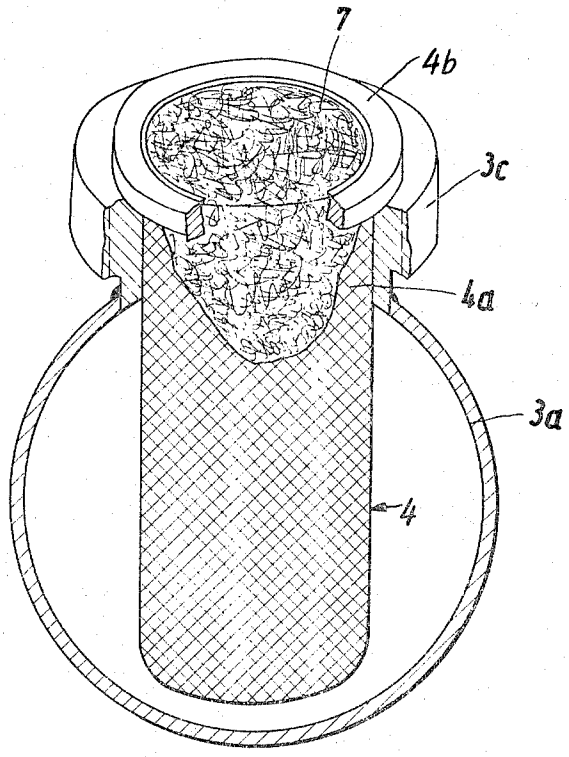
By Mulglow and Toren
attorneys

May 23, 1967 S. KOFINK 3,320,997

COMBUSTION DEVICE WITH PRE-COMBUSTION CHAMBER

Filed Nov. 17, 1965 3 Sheets-Sheet 3

Fig.3



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COMBUSTION DEVICE WITH PRE-COMBUSTION CHAMBER

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9 Claims. (Cl. 158—28)

This invention relates, in general, to combustion devices and, in particular, to a new and useful carburetor burner having means for vaporizing liquid fuel in a porous vaporizer body arranged in the combustion air stream.

Combustion devices are known which include a porous body which is arranged at an end face of a cylindrical combustion chamber. In such construction, the rear covering cap is connected with the fuel line which is guided into the chamber from the outside and the fuel is supplied by a pump. The combustion air passes through an opening into the cylinder shell radially in the plane of the porous body and the secondary combustion air is directed through a second opening. In the zone of this second opening, the combustion chamber is usually enveloped by a combustion air housing for the purpose of air conduction which is a very costly construction. With such a construction, there is a disadvantage that the fuel may drip off the vaporizer body and get into the construction air housing at the bottom thereof so that an overflow ensues. A further disadvantage is that the efficiency of the mixture is rather poor as the finely divided combustion air entering radially through the perforations forms dead spaces just before the unilaterally swept porous body.

In accordance with the present invention, there is provided a simple and less expensive combustion device which includes a tubular conduit or pipe through which the combustion air for the combustion chamber is introduced. This tubular pipe is designed as a precombustion chamber and a porous body vaporizer is arranged across the air stream. Behind the porous body in the direction of air flow is located an igniting means for effecting the combustion. In a preferred arrangement, the vaporizer body consists of a housing filled with steel wool or similar material with a fuel inlet line connected into the top from the outside. The vaporizer body acts in the arrangement of the invention as a swept displacement body through which the subdivided air streams undergo a contraction. By the resulting acceleration and the sweeping of the vaporizer body from all sides, a very intensive fuel vaporization is brought about. In a preferred arrangement, the igniting device includes a spark plug with one terminal and the vaporizer body is made of a material which forms the other terminal. They are arranged to extend downwardly through the tube for conducting the combustion air in a manner such that the igniting device is shielded by the vaporizer body.

Accordingly, it is an object of the invention to provide a very inexpensive carburetor burner which provides means for efficiently admixing fuel to the combustion air stream.

A further object of the invention is to provide a carburetor burner in which incoming combustion air is directed through a tubular conduit in which is located a porous body and igniting means, and wherein fuel is directed to the porous body from the exterior of the device.

A further object of the invention is to provide a carburetor burner which is simple in design, rugged in construction and economical to manufacture.

For an understanding of the principles of the invention, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a top plan view partly in section of a carburetor device constructed in accordance with the invention;

FIG. 2 is a section in elevation of a modified portion of FIG. 1; and

FIG. 3 is an enlarged partial sectional and partial perspective view indicating the porous body.

Referring to the drawings, in particular, the invention embodied therein comprises a combustion device which includes a fan or blower **1** having an intake **10** which is arranged to discharge into a combustion device housing or conduit generally designated **12**. In the embodiment illustrated, the combustion device housing **12** forms a precombustion chamber and the gaseous products of combustion are directed after ignition into a secondary combustion chamber **2** which in the embodiment illustrated is a ring burner.

In accordance with the invention, the combustion device housing includes a tubular conduit **14** which is fitted to the discharge of the fan **1** at the location of a peripheral conduit extension **3**. It is also provided with a deflector or baffle **14***a* which is located between the tubular portion **14** and a tubular extension **2***a* of the secondary combustion chamber **2**. The conduit **14** is provided with fittings or cylindrical extensions **3***b* and **3***c* for receiving an ignitor means or spark plug **5** and a vaporizing element or porous body **4**, respectively. A fuel line **6** is connected to the top of the vaporizing element **4** and supplies fuel to the interior thereof at the location of a chamber which contains a material such as steel wool **7**. Air flow through the tube **14** is indicated in FIG. 2 by the arrow **16**.

A feature of the inventive construction is that the vaporizing cartridge **4**, as indicated in FIG. 2, and the spark plug **5** are so arranged at an angle to each other that at the bottom of the conduit **14**, they are spaced slightly apart. In the embodiment shown, the cartridge **4** has a screen housing **4'** which acts as a counter electrode of the spark plug **5** which is only equipped with a single electrode pin **5***a*.

As indicated in FIG. 3, the cartridge **4** includes an outer screen **4***a* and an interior which is filled wih special steel wool fiilings **7**. An upper rim **4***b* of the cartridge **4** fits over a flange portion of the fitting **3***c*. When the air flows in the direction of the arrow **16**, it sweeps through the wire material **4***a* with part passing through the steel wool **7** and parts sweeping around the cylindrical wire mesh portion **4***a*. The spark plug **5** is located in alignment with the cartridge **4** so that it is shielded from the advancing air stream.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A combustion device comprising a tubular conduit for the flow of a combustion air stream therethrough and defining a precombustion chamber, a cylindrical porous body fuel vaporizer of a cross-section smaller than said conduit disposed across said conduit with its axis at an acute angle to the flow axis of the air stream, means for admitting fuel into the porous body for passage through the pores of said body and for vaporizing and mixing with the air stream, means for directing a combustion air stream through said conduit from one side of said porous body, and ignition means for igniting

the fuel and air mixture disposed directly adjacent said porous body on an opposite side thereof from the oncoming combustion air stream so as to be shielded by said porous body from the flow of the air stream laterally of said porous body.

2. A combustion device, according to claim 1, wherein said ignition means includes a spark plug.

3. A combustion device, according to claim 2, wherein said spark plug includes a single electrode, said porous body including a portion forming a counter electrode.

4. A device, according to claim 3, wherein said porous body includes a wire mesh outer portion forming a counter-electrode.

5. A device, according to claim 4, wherein said porous body includes a steel wool interior.

6. A device, according to claim 1, wherein means for directing combustion air flow through said conduit includes a fan connected to said conduit for directing air under pressure through said conduit.

7. A combustion device, according to claim 6, including a secondary combustion chamber connected to said conduit.

8. A combustion device, according to claim 6, including a secondary combustion chamber connected to said conduit at the end thereof opposite from said fan.

9. A combustion device, according to claim 8, including a baffle in said conduit adjacent the electrode of said spark plug.

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