

Aug. 28, 1923.

1,466,006

S. TROOD

APPARATUS FOR PRODUCING AND UTILIZING COMBUSTIBLE MIXTURE

Original Filed Sept. 14, 1920 3 Sheets-Sheet 1

FIG. 1.

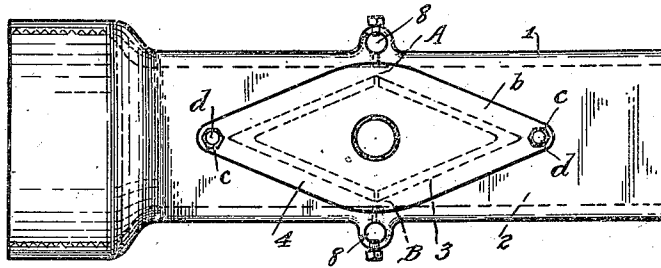


FIG. 2.

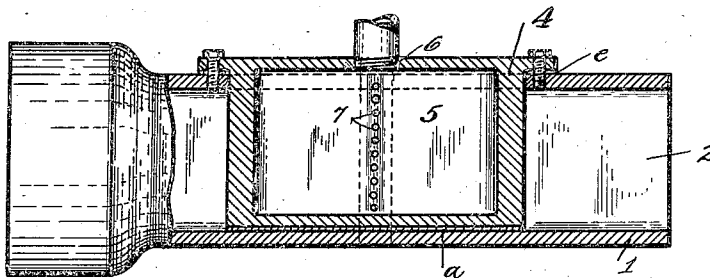


FIG. 3.

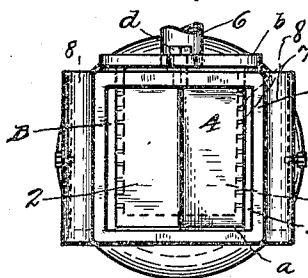


FIG. 4.

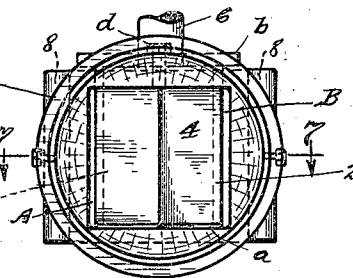


FIG. 5.

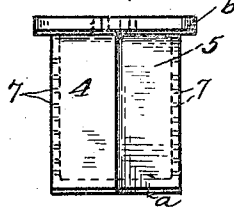
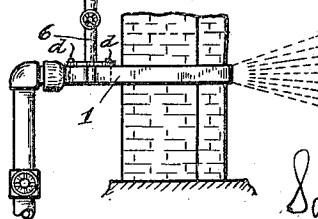


FIG. 6.



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3 Sheets-Sheet 2

FIG. 7.

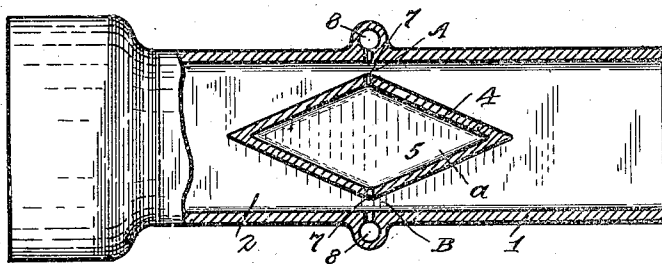


FIG. 8.

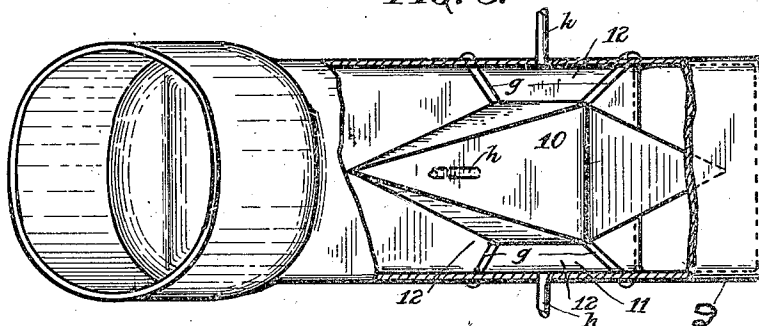
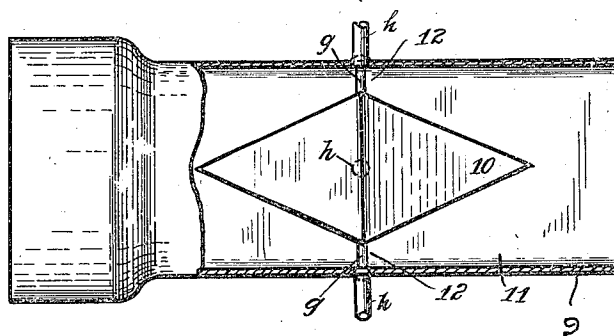


FIG. 9.



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3 Sheets-Sheet 3

FIG. 10.

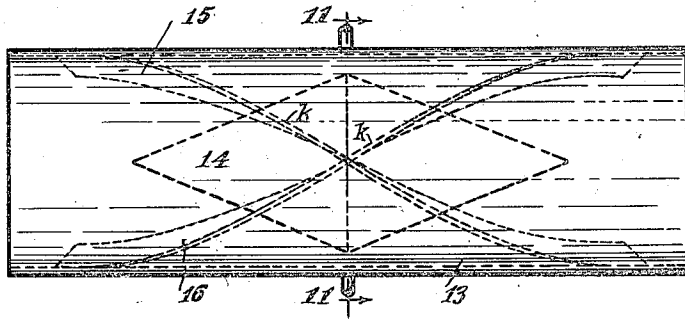


FIG. 11.

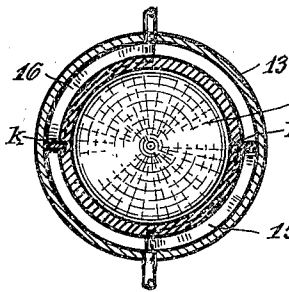
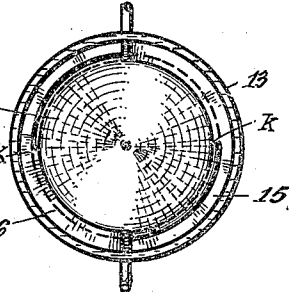


FIG. 12.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PRODUCING AND UTILIZING COMBUSTIBLE MIXTURE.

Application filed September 14, 1922; Serial No. 410,350. Renewed June 16, 1923.

To all whom it may concern:

Be it known that I, SAMUEL TROOD, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Producing and Utilizing Combustible Mixtures, of which improvement the following is a specification.

My invention relates to improvements in devices for producing combustible mixture, i. e., either gaseous, fuel and air or fluid fuel and air or both gaseous and fluid fuel and air and feeding the same to a point of combustion or to a heating chamber.

The object of the invention is to produce a device of this character, having means, including series of constricted passages for feeding gaseous or fluid fuel or both to a point of combustion by pressure or suction induced by air currents traversing said constricted passages.

Another object is to produce a unitary structure of this character in which a plurality of Venturi passages are formed, whereby combustible mixture traversing said passages is segregated or broken into separate and independent streams which intersect at the point of combustion or the point of entering the heating chamber and diverge or spread at such point.

I accomplish these objects by means of the device hereinafter more specifically described, reference being had to the accompanying drawings, forming part hereof, in which:

Fig. 1 is a plan view of the device.

Fig. 2 is a side elevation, partly in section.

Fig. 3 is an end view of the right-hand side of the device.

Fig. 4 is an end view of the opposite end.

Fig. 5 is an end view of the plug.

Fig. 6 is a conventional view, showing the installation of the device.

Fig. 7 is a plan view, partly in section, of the structure shown in Fig. 1.

Fig. 8 is a plan view, partly in section, of a modified form of my improved device.

Fig. 9 is a side elevation, partly in section.

Fig. 10 is a side elevation of another modification of my improved device.

Fig. 11 is a section on line 11—11 of Fig. 10.

Fig. 12 is an end view taken from the left of Fig. 10.

Referring to said drawings, 1 is a shell or case enclosing a rectangular chamber or channel, 2. One end of said shell is preferably tubular in form, for the purpose of enabling the same to be connected to a tubular supply pipe. The top or upper side of said shell is provided with an opening, 3, of diamond shape or configuration, in which a correspondingly shaped obstructing plug, 4, is adapted to be inserted, the said plug extending to and resting upon the bottom of said channel, and having a sheet of asbestos fiber, *a*, secured thereon, for the purpose of forming an indestructible joint at such point; the upper side or top of said plug being provided with a laterally extending flange, *b*, having threaded orifices, *c*, for the reception of bolts, *d*, whereby the said plug is securely fastened to said shell or case. An asbestos gasket, *e*, may be interposed between the surfaces of said flange and the top of said case. The said chamber or channel, 2, obstructed by said plug, 4, forming dual venturi, A, B, one at each side of said chamber, whereby fluid passing through said chamber is divided into two separate intersecting streams, tending towards a common exit orifice. The said plug is provided with a centrally disposed chamber, 5, the top of which is provided with a screw-threaded orifice to receive a gas supply pipe, 6, and is provided with numerous laterally projecting orifices, 7, 7, extending therefrom towards the wall of the chamber at the most constricted portion of the several venturi. Gas supplied by said supply pipe, 6, to said central chamber, 5, is discharged through said small orifices, 7, 7, at such point and oil charged into the vertically disposed chambers or channels, 8, is discharged through a small opening in the wall of said channel, 8, into the constricted portion of said venturi, immediately opposite the said several small openings, 7, 7. Air under pressure, and, if desirable, at a raised temperature, is admitted at the entrant of said shell and meets or contacts with the oil and gas admitted as heretofore described, breaking said oil and gas into infinitesimally small globules, vapor or gas, the pressure of the air being reduced and the velocity increased correspondingly with the relative areas of the orifices through which the same passes. The mixture is thus formed in separate streams, intersecting to-

wards the exit of the chamber or channel and tending to spread or widen at such point.

In Figs. 8 and 9, I show a modified form of my improved apparatus. In said figures, 9 is a shell or casting similar to that shown in Fig. 1. A plug or obstructing member, 10, of pyramidal configuration, is disposed in the channel, 11, being secured therein by means of the rods, *g*, and forming a plurality of constricted or Venturi passages, 12. A pipe or pipes, *h*, *h*, are inserted in openings of the wall of the casting for the purpose of introducing gaseous fuel into said Venturi passages. The operation of the apparatus of said Figs. 8 and 9 is similar to that of the structure shown in Fig. 1.

In Figs. 10, 11 and 12 is shown another modification of my improved device. The device herein shown includes a casting, 13, provided with a channel therethrough. A plug or obstructing member, 14, of the form of a truncated cone is disposed in said channel, forming a constricted area or peripheral channel between the obstructing member and the inner walls of the shell, a number of spirally disposed vanes or blades, 15, 16, being secured in notches, *k*, formed in the enlarged portion of said truncated cone, the free ends of said vanes or blades being suitably secured in the ends, respectively, of the casting interiorly. The said obstructing member being adapted to be adjustably positioned in said channel, for the purpose of varying the suction effect at the point of fuel admission to said constricted area.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. A device for producing and utilizing combustible mixture, which includes a shell having a channel therethrough, a plug or abutment secured in said shell, the side walls of said plug and the walls of said channel co-operating to form a plurality of Venturi passages, in combination with means for feeding a combustible substance into said channel at the most constricted portion of said Venturi passages.

2. A device for producing and utilizing combustible mixture, which includes a shell having a channel longitudinally thereof, the said channel being provided with means for attachment to an air supply pipe, a plug obstructing said channel, the walls of said plug and the walls of said channel co-operating to form dual Venturi passages, the said plug having a centrally disposed chamber and a plurality of minute openings extending from said chamber towards the walls of said channel, and means to supply said chamber with a combustible substance.

3. A device for producing and utilizing

combustible mixture, which includes a casting having a passage provided with an intake and a discharge opening, a plug disposed in said passage adapted to form a restricted area in said passage between the inner wall thereof and the sides of said plug adjacent, means to introduce a combustible mixture into said passage in the vicinity of the constricted area and means to carry the said mixture towards the exit by suction induced by air currents traversing said passage.

4. A device for producing and utilizing combustible mixture, which includes a casting having a passage provided with an intake and a discharge opening, a chamber communicating with said passage, a plug disposed in said passage, adapted to form a constricted area in said passage between the inner wall thereof and the sides of said plug adjacent, the said plug having a chamber communicating with said passage, in the vicinity of said constricted area, means to introduce a fluid fuel to the chamber in said casting, and means to introduce gaseous fuel to the chamber in said plug, and means to carry the said mixture, gaseous and fluid fuel, towards the exit of said passage by suction induced by air currents traversing said passage.

5. A device for producing and utilizing combustible mixture, which includes a casting having a passage provided with an intake and discharge opening, a plug disposed in said passage adapted to form a constricted area in said passage between the inner wall thereof and the sides of said plug adjacent, means to introduce a combustible mixture into said passage in the vicinity of the constricted area, and means to carry the said mixture towards the exit.

6. A device for producing and utilizing a combustible mixture, which includes a casting having a passage provided with an intake and discharge opening, a chamber communicating with said passage, a plug disposed in said passage adapted to form a constricted area in said passage between the inner wall thereof and the sides of said plug adjacent, the said plug having a chamber communicating with said passage in the vicinity of said constricted area, means to introduce a fluid fuel to the chamber in said casing, means to introduce gaseous fuel to the chamber in said plug, and means to carry the said mixture, gaseous and fluid fuel, towards the exit of said passage.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

SAMUEL TROOD.

In the presence of—

JOHN H. RONEY,

CLARENCE A. WILLIAMS.