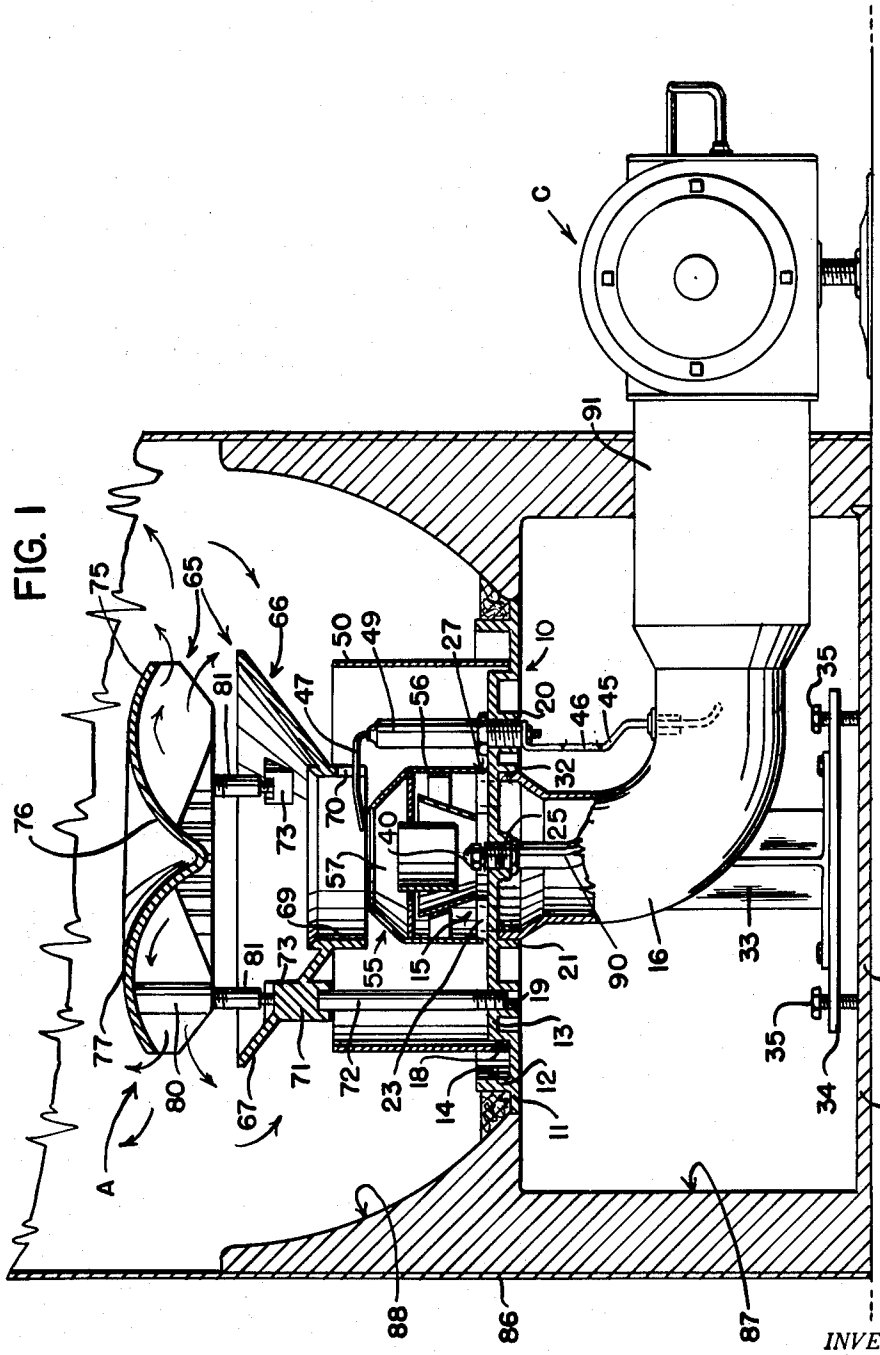
Jan. 31, 1956 L. VIGNERE, SR 2,732,890

OIL GAS GENERATING BURNER STRUCTURE

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FIG. 1



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FIG. 2

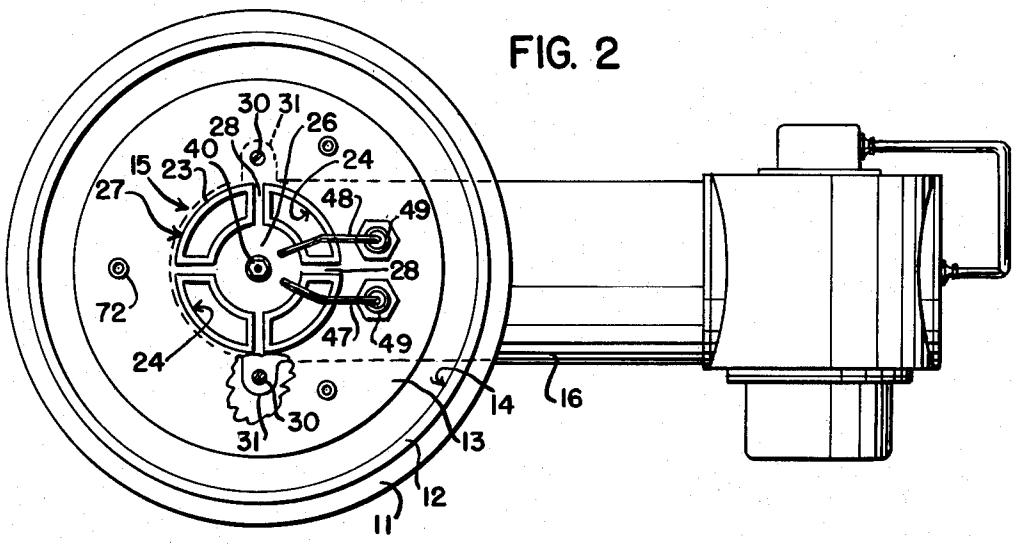
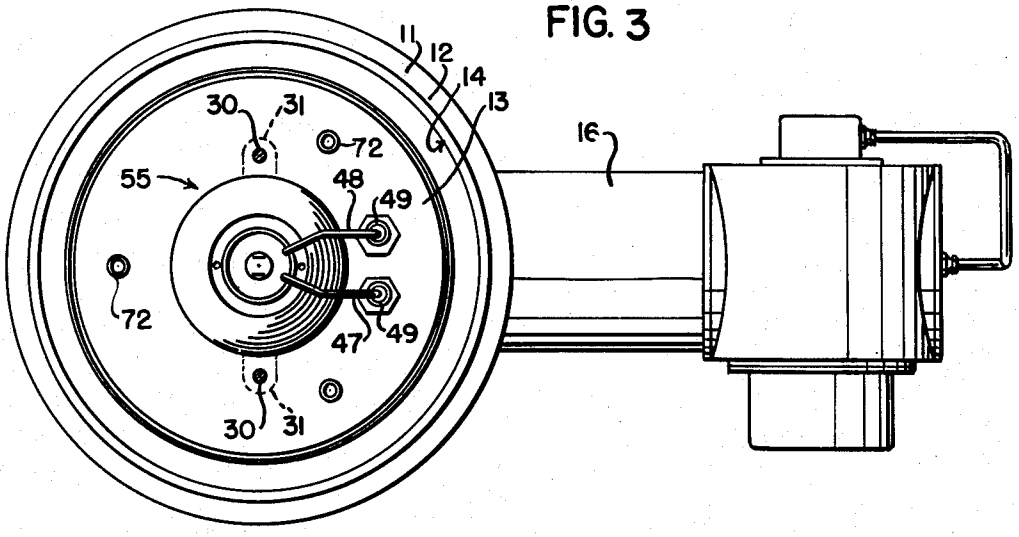


FIG. 3



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OIL GAS GENERATING BURNER STRUCTURE

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FIG. 4

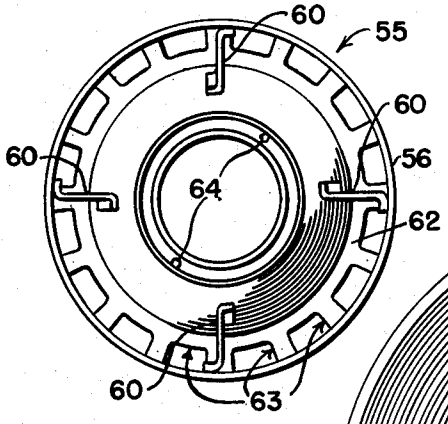


FIG. 5

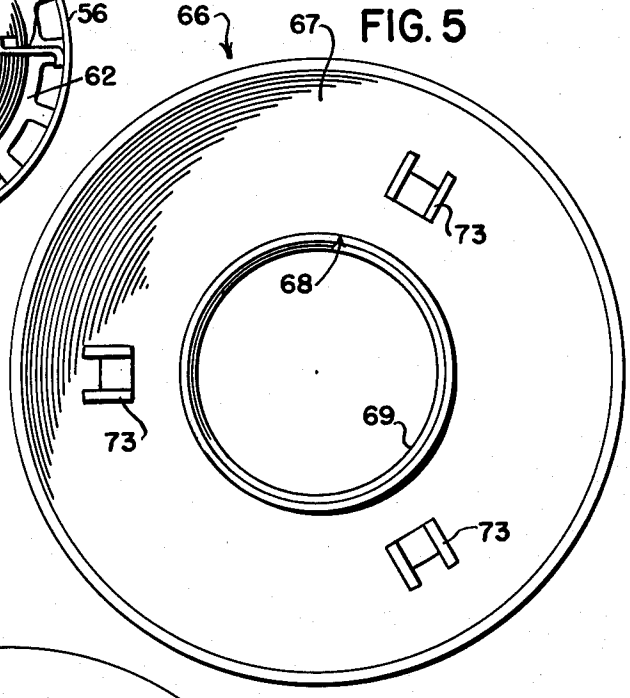
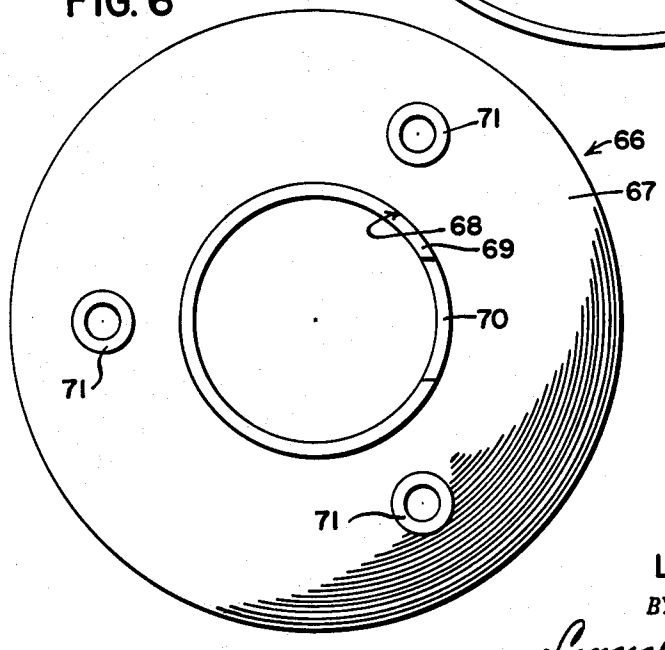


FIG. 6



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FIG. 7

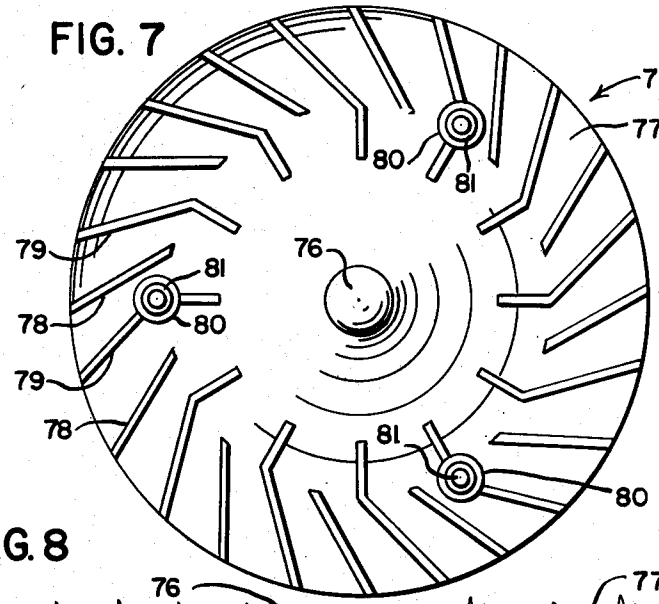
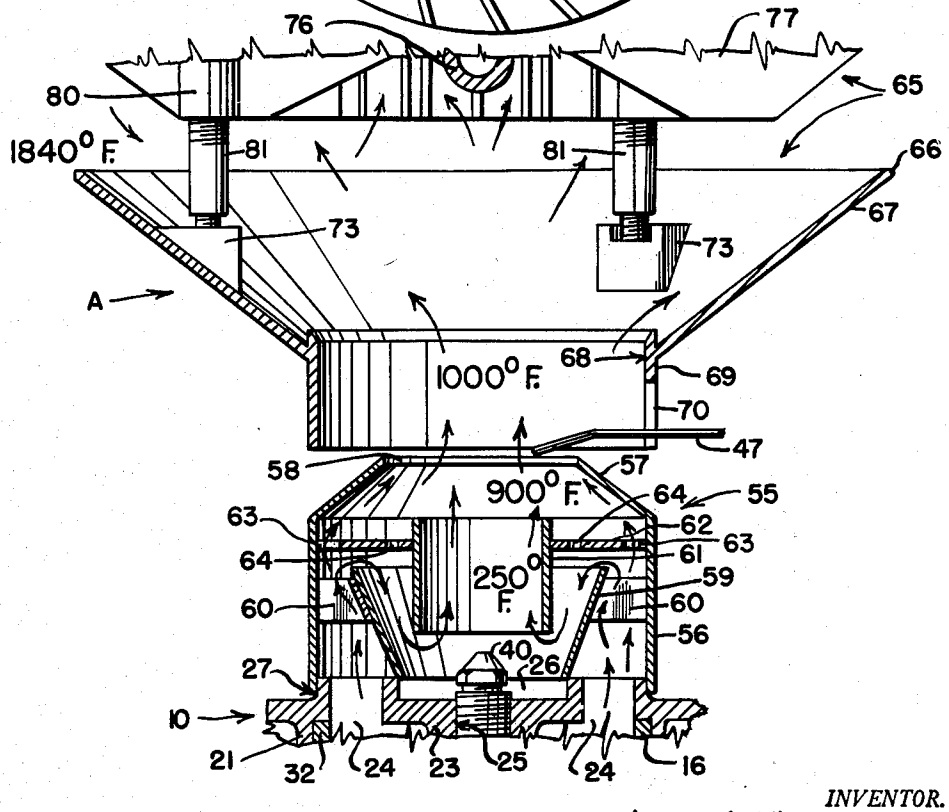


FIG. 8



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United States Patent Office 2,732,890 Patented Jan. 31, 1956

2,732,890

OIL GAS GENERATING BURNER STRUCTURE

Leonard Vignere, Sr., New Castle, Pa.

Application September 4, 1952, Serial No. 307,860

10 Claims. (Cl. 158—28)

This invention relates to oil gas generating combustion heads and burners employing such heads and is a continuation in part of my application Serial No. 188,380, filed October 4, 1950, for Oil Gas Generator-Burner, now Patent No. 2,670,032, granted February 23, 1954.

In the present invention, I have redesigned the casing surrounding the oil nozzle, eliminated the plurality of nipples or sleeves which defined air passages and redesigned the support plate which was associated with the nipples or sleeves. All of these changes contribute to a very desirable preheating of the combustion air in two stages, as will be described. An object of the invention is to provide a structure embodying these changes.

Additionally, I have redesigned the upper end portion of the apparatus, as previously disclosed, to provide a particularly efficient firing head.

Other objects and advantages of the invention will be apparent during the course of the following detailed description of the invention, taken in connection with the accompanying drawings forming a part of this disclosure, and in which drawings:

Fig. 1 is a vertical section of the oil gas generating combustion head and a portion of a furnace, associated with means to conduct fluids to the combustion head, with the means in elevation.

Fig. 2 is a top plan of the means of Fig. 1 and of the lowermost portion of the combustion head.

Fig. 3 is a similar top plan of the means of Figs. 1 and 2 with the addition to Fig. 2 of the casing surrounding the oil nozzle.

Fig. 4 is a bottom plan of the casing of Fig. 3 but enlarged over the showing in Fig. 3.

Fig. 5 is a top plan of the lower section of the firing head of the new apparatus.

Fig. 6 is a bottom plan of this lower section of Fig. 5.

Fig. 7 is a bottom plan of the upper section of the firing head.

Fig. 8 is a vertical section, on an enlarged scale, of the casing with fragments of the associated structure in vertical section and all enlarged over the showing in Fig. 1.

In the drawings wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates the oil gas generating combustion head, B designates a furnace and C, means to conduct the fluids to the combustion head.

The oil gas generating combustion head A includes a support means 10 which is preferably horizontally-disposed circular plate 11 provided with an upstanding cylindrical flange or collar 12 spaced inwardly of its periphery, a circular raised intermediate portion 13 spaced from the flange 12, to define a circular channel 14 in the space between the flange 12 and central portion 13, and the latter is stepped, inwardly of its peripheral wall to provide a combined means 15 for centering the casing 55 and providing inlets for a gaseous fluid such as air, and the support means 10 may also include a suitable conduit 16 for

this fluid upon which conduit may be mounted conductors 45 and 46 of the igniter means for the head A.

The raised portion 13 of the plate 11 provides at its periphery a shoulder 18 and the plate may be provided with a plurality (as three) of spaced-apart screw threaded sockets 19 opening to its upper face in the space between the channel 14 and means 15 for supports for the lower section of the firing head to be later described. There are also suitable screw threaded openings 20 (as two) for the conductors 45 and 46 and electrode holders 49 and 49' for the firing electrodes 47 and 48. A downwardly extending flange 21 below and forming a part of the plate 10 may be provided for centering the plate 10 with reference to the exit mouth of the conduit 16.

Referring again to the means 15, the same comprises a circular stepped portion 23 so that an upwardly extending peripheral shoulder is provided, inwardly of which is a plurality of arcuate air openings 24, shown best in Fig. 2, extending from the lower face of the portion 23 to its upper face to provide air inlets from the conduit 16 to the interior of the casing 55, and inwardly of and spaced from the openings 24 is a central screw-threaded opening 25 from face to face accommodating an upwardly extending fuel nozzle 40, which is set into a central basin 26 in the portion 23. The outer periphery of the portion 23 provides a shoulder 27. From the central basin 26 channels 28 radiate to the upper face of the intermediate portion 13.

In order to secure the plate 10 to the conduit 16, I prefer to provide a pair of bores, disposed substantially 180° apart in the portion 23 and extending from face to face, with suitable stove bolt shanks 30 in the bores and extending through perforations in a pair of ears 31 extending substantially horizontally outwardly from the upper end of the conduit 16 and the ends of the shanks projecting below the ears 31 being provided with nuts, as conventional thumbnuts.

The conduit 16 is preferably somewhat J-shaped with an upper end 32 extending inwardly of the flange 21 and in contact therewith. This conduit 16 may be supported by a bracket 33 secured to a bottom horizontally disposed plate 34 carrying levelling screws 35, to bear against the floor or bottom of the furnace B, in order to level the conduit 16.

The nozzle 40 may be of any approved kind such as one having a central bore, an upwardly-opening orifice and a screw-threaded lower end portion for attachment at the screw-threaded opening 25.

The electrical conductors 45 and 46 preferably extend through the conduit 16 and through and out of two spaced-apart openings in the wall thereof from which they then extend upwardly to the openings 20 and are electrically connected as is well known in the art to electrodes 47 and 48 carried by the electrode holders 49 and 49' having lower end screw threads and which may be screwed into the openings 20. The conduit 16 is substantially like that disclosed in my application referred to above.

Extending upwardly from the plate 11, is a cylindrical housing 50 with the lower part of its inner face adjacent the shoulder 18. This housing is substituted for the pair of spaced upstanding rings of my application referred to above and which surround the sides of and are spaced from the casing 55.

The novel casing 55 shown particularly in Figs. 3, 4 and 8, includes a cylindrical outer, upstanding wall 56 and from the upper end thereof extends the cone shaped wall 57 with a central opening 58. Inwardly of and spaced from the wall 56 is an inner wall 59 which is upwardly and outwardly flaring or inverted truncated-conical with its bottom edge spaced above the horizontal plane of the bottom edge of the wall 56. This wall 59 is carried by the wall 56 as by spaced-apart inwardly ex-

tending brackets 60, secured in any approved way to the walls 56 and 59.

Partly within the upper part of the space within the truncated conical wall 59 is a third wall 61 which is preferably cylindrical and is, of course, spaced from the wall 59. It extends upwardly above the horizontal plane of the upper edge of the wall 59 and is carried by an open-centered disc 62 providing a baffle and secured in any approved way to the walls 56 and 61. At its edge portion, the disc 62 is provided with a plurality of spaced-apart cut-outs providing a plurality of arcuate openings 63. Additionally, the disc 62 is provided with a plurality of preferably small spaced-apart perforations 64 adjacent the open center of the disc 62 so that they open above the space defined by the wall 59, above the channels 28 and below the opening 58, and provide drip holes.

The upper edge of the wall 61 is spaced above the disc 62, is at substantially the horizontal plane of the lower end of the wall 57 and, of course, is spaced well below the mouth 58. The axial centers of the walls 56, 59 and 61 coincide and also substantially coincide with the axial center of the orifice in the nozzle 40.

Of course, the casing 55 is retained centered by the shoulder 27.

Referring now to the firing head 65, the lower section 66 thereof is shown, particularly in Figs. 5, 6 and 8 and comprises a somewhat dish-shaped body portion 67 open at its bottom to provide a substantially circular opening 68 and surrounded by a depending flange 69 carried by the body portion 67 and having a cut-out 70 extending from the lower edge of the flange to the juncture of flange 69 and body portion 67. This cut-out is provided to accommodate portions of the electrodes 47 and 48 which must be spaced from the flange 69 and the free end portions thereof overhang the mouth 58. There is carried by the under side of the body portion 67 a plurality of socketed members 71 with downwardly-opening mouths to receive the upper end portions of legs 72 which are screw-threaded at their lower end portions and are in screw-threaded engagement with the screw threads of the sockets 19. The upper side of the body portion 67 carries a plurality of spaced-apart slotted lugs 73 to receive, in their upwardly-opening slots a plurality of legs carried by the upper section 75 of the firing head 65. It will be noted that the upper end portion of the flange 69 extends upwardly through the opening 68 for a short distance.

The upper section 75 of the firing head 65 is best shown in Figs. 1 and 7 and includes a deflecting central cone portion 76 with the cone extending downwardly and a peripheral flange portion 77 integral therewith and having a concave lower surface, somewhat similar to the deflecting cone and peripheral flange of my application referred to above. However, in place of the partitions and baffles of the upper structure of the application referred to above, I provide, for the present structure a plurality of baffles 78 and 79 depending from the under side of the flange portion 77 and extending from the periphery of the flange portion generally non-radially toward and substantially tangentially to the periphery of the cone portion 76. Preferably, each alternate baffle (being the baffles 79) has a short radially-extending portion at its inner end. It will be noted in Fig. 7 that the arrangement of baffles 78 and 79 is such that there is a larger distance between the outer ends of adjacent baffles than between the inner ends of the baffles 78 and the juncture of the non-radially and radially extending portions of the baffles 79 which is found to provide for an efficient heating of the air. Extending downwardly from the lower or bottom face of the flange portion 77 are a plurality of screw-threaded sockets 80 to receive the upper screw-threaded end portions of legs 81, the lower end portions of which legs are adapted to extend into the slots of the slotted lugs 73.

Shown merely by way of illustration is the furnace B having a bottom 85 and outer side wall 86 enclosing an ash pit 87 and above which is the fire box 88, with the new apparatus contained therein as is well known in the art.

Any suitable means C may be provided to conduit suitable fluids to the combustion head A. For example, the fluids may be oil and air under pressure with the oil flowing through piping 90 which may extend through the conduit 16 and is operatively connected with the lower end portion of the nozzle 40. The air flows through the conduits 91 and 16 and then through the plurality of arcuate fluid openings 24 and enters the space between the walls 56 and 59, as shown in Figure 8. It flows along the outer surface of the outwardly flaring wall 59 where it strikes the disc 62 and is baffled over the upper edge of the wall 59 and thence downwardly along the inner surface of the wall 59 and outer surface of the cylindrical wall 61 to flow under the lower edge of that last-named and thence upwardly along its inner surface and from there out of the upper open end of the cylindrical wall 61. However, another volume of the air in the space between the walls 56 and 59 will flow through the arcuate openings 63 in the disc 62. That flowing through the openings 63 will be deflected upwardly and inwardly by the wall 57 and out of the upper mouth 58. With the arrangement shown in Fig. 8 of nozzle 40, casing 55 and electrodes 47 and 48, and associated with the head 65, using a conventional grade of fuel oil under normal pressure ejected from the nozzle 40 and the electrodes discharging properly, the temperatures will be, for example, substantially 250° F. within the cylindrical wall 61, 900° F. above this wall and under the wall 57, 1000° F. within the circular flange 69 and 1840° F. after contact with and being baffled by the baffles 78 and 79 and contact with the cone portion 76, as shown in Fig. 1.

There is thus provided a gasifying area for the oil mist just below the flange portion 77 and in the vicinity of the cone portion 76.

The specific firing head 65 is necessary in conjunction with the casing 55 in order to promote correct gasifying of the oil mist, utilization of all of the oil gas, and elimination of most of the undesirable solid products of combustion adhering to the head A.

The central basin 26 receives oil drippings from the perforations 64 and the channels 28 conduct the collected drippings to spread over the upper surface of the intermediate portion 13, thus preventing the drippings from finding their way into the openings 24 and the conduit 16.

It will be noted that the lower edge of the flange 69 is immediately above the upper mouth 58 so that there is no undesirable escape of air to the outside of the flange 69.

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or scope of the claims.

What is claimed is:

1. An oil gas generating burner structure including a substantially vertically-disposed casing having open upper and lower ends, a substantially horizontally-disposed disc carried by said wall and having a central opening and a drip hole, an upstanding open-ended cylindrical wall within said casing being spaced inwardly of the wall thereof and carried by said disc at said central opening and a substantially horizontally-disposed plate beneath said wall and beneath and spaced from said disc and provided with a nozzle extending upwardly into said casing axially of said central opening, said plate being formed with a basin surrounding the lower end portion of said nozzle, means to guide drip from said drip hole into said basin, said plate being formed with a channel opening into said basin and extending away from said basin, and said plate being formed with air inlets to the space inwardly of the wall of said casing with their discharge mouths above the bottoms of the basin and channel.

2. An oil gas generating burner structure according to claim 1, characterized in that said inlets have side and

end walls upstanding from said plate, said end walls defining the side walls of said channel, and the innermost of said side walls of said inlets defining the upstanding wall of said basin.

3. An oil gas generating burner structure according to claim 1, characterized in that said inlets have side and end walls upstanding from said plate, said end walls defining the side walls of said channel, the innermost of said side walls of said inlets defining the upstanding wall of said basin and the outermost of said side walls of said inlets being in contact with the wall of said casing.

4. An oil gas generating burner structure according to claim 1, characterized in that said inlets have side and end walls upstanding from said plate, said end walls defining the side walls of said channel, the innermost of said side walls of said inlets defining the upstanding wall of said basin and the outermost of said side walls of said inlets being arcuate and in contact with the wall of said casing.

5. An oil gas generating burner structure according to claim 1, characterized in that said casing has an inner wall spaced from said outer wall, and said inlets have side and end walls upstanding from said plate, with said end walls defining the side walls of said channels, the innermost of said side walls of said inlets being arcuate and defining the upstanding walls of said basin and in contact with the lower portion of said inner wall, and the outermost of said side walls of said inlets being arcuate and in contact with the lower portion of the walls of outer wall of said casing.

6. An oil gas generating burner structure according to claim 1, characterized in that said casing has an inverted frustro-conical inner wall spaced from said outer wall, and said inlets have side and end walls upstanding from said plate, with said end walls defining the side walls of said channels, the innermost of said side walls of said inlets being arcuate and defining the upstanding walls of said basin and in contact with the lower portion of said inner wall, and the outermost of said side walls of said inlets being arcuate and in contact with the lower portion of said outer wall of said casing.

7. An oil gas generating burner structure provided with an upstanding cylindrical casing having open upper and lower ends and defining a chamber, an inverted frusto-conical open-ended wall within said chamber and having a bottom edge spaced above the horizontal plane of the bottom edge of the cylindrical casing, a substantially horizontally-disposed disc carried by the cylindrical casing within said chamber and having a drip opening and a central air opening, and an upstanding open-ended cylindrical wall inwardly of said frusto-conical wall carried by said disc at said opening and extending upwardly and

downwardly from said disc, the bottom edge of the cylindrical wall being spaced above the bottom edges of said frusto-conical wall and cylindrical casing, a substantially horizontally disposed plate upon which the lower edge of the first-named cylindrical wall is disposed, a nozzle carried by said plate and extending upwardly and axially into the space within the lower portion of said frusto-conical wall, said plate being formed with a basin surrounding the lower end portion of said nozzle, said drip opening being disposed directly above the upper open end of said frusto-conical wall, said plate being formed with a plurality of channels opening into said basin and extending therefrom, and said plate also being formed with a plurality of air inlets with their discharge mouths above the bottoms of the basin and channels and in communication with said air opening.

8. An oil gas generating burner structure according to claim 7, characterized in that said inlets have upstanding side and end walls, said end walls defining the side walls of said channels, and the innermost of said side walls of said inlets defining the side walls of said basin.

9. An oil gas generating burner structure according to claim 7, characterized in that said inlets have upstanding side and end walls, said end walls defining the side walls of said channels, the innermost of said side walls of said inlets defining the side walls of said basin and the outermost of said side walls of said inlets being in contact with the lower end of said casing.

10. An oil gas generating burner structure according to claim 7, characterized in that said inlets have upstanding side and end walls, said end walls defining the side walls of said channels, the innermost of said side walls of said inlets defining the side walls of said basin and the outermost of said side walls of said inlets being in contact with the lower end of said casing and the innermost of said side walls of said inlets being in contact with the outer face of said bottom edge of said frustro-conical wall.

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