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ARRANGEMENT OF THERMOCATALYTIC HEATING ELEMENTS

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FIG. 1.

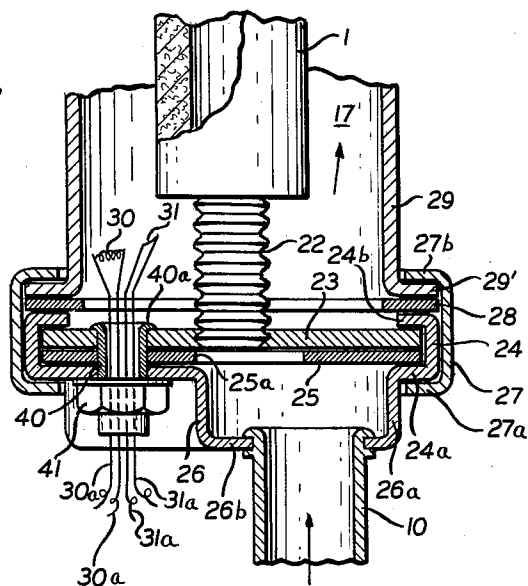


FIG. 2.

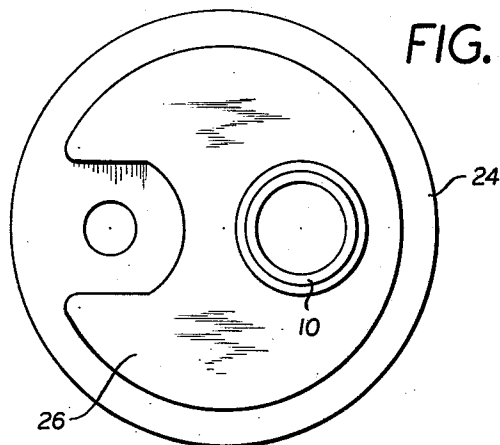
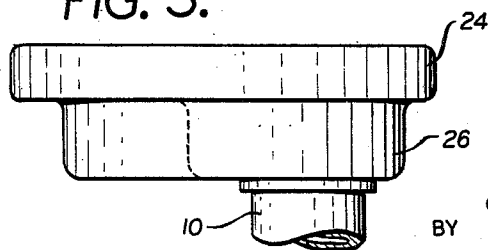


FIG. 3.



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ARRANGEMENT OF THERMOCATALYTIC HEATING ELEMENTS

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2 Claims. (Cl. 158—99)

This invention relates to combustion heating systems and more specifically, to the relative arrangement of supporting, controlling and feeding devices for combustion heating elements.

One of the objects of the invention is to provide improved mounting means for an elongated, tubular, porous combustion element having an open inlet end for reception of combustion gases for passage of said gases through the wall of said combustion element.

Another object of the invention is to provide improved mounting means for the aforesaid combustion element, together with ignition means, the mounting means being arranged so as to provide improved location for the igniting means.

In accordance with the preferred embodiment of the invention, I provide an elongated tubular porous combustion element having an open inlet end for reception of combustion gases for passage of gases through the wall of the combustion element. I also provide mounting means for the combustion element comprising an elongated sheath tube having an inlet end and surrounding and spaced from the periphery of the combustion element. The inlet end of the combustion element is spaced inwardly of the inlet end of the sheath tube.

The mounting means further comprises disc means and means mounting the disc means transversely and sealingly on the inlet end of the sheath tube. A hollow support tube is fixed at one end thereof to the disc means and extends inwardly thereof, the disc means having through bore means communicating with the bore of the support tube. The support tube extends supportingly into the bore of the combustion element.

Also in accordance with the preferred embodiment, the support tube is transversely corrugated so as to be flexible and thereby permit transverse movement of the combustion element. Also in accordance with the preferred embodiment, I provide igniter means for the combustible gases and means mounting the igniter means in the interior space of the mounting means for the combustion element, adjacent the inlet end of the sheath tube and outwardly of the inlet end of the combustion element. The supply means for the igniter means are extended through the wall of the mounting means for the combustion element. By way of example, and without limitation thereto, the igniter means and the supply means therefor may be mounted upon the aforesaid disc means.

Other objects and advantages of the invention will become apparent from the following description, in conjunction with the annexed drawing, in which a preferred embodiment of the invention is disclosed.

In the drawing,

FIG. 1 is a longitudinal section of the structure in accordance with the preferred embodiment of the invention.

FIG. 2 is an end elevation of one of the elements shown in FIG. 1.

FIG. 3 is a side elevation of the element shown in FIG. 2.

Upon reference to the drawing in detail, it will be noted that it shows a member 24 and a tube 29 held together by retaining member 27, with the member 24 in turn supporting a transverse disc 23. Combustion element 1 is in turn mounted upon disc 23 by means of tube 22.

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Said retaining member or collar 27 has a longitudinally extending peripheral wall and transverse, annular, intumed end flanges 27a and 27b, flange 27b being located inwardly of flange 27a. The member 24 has a longitudinally extending cylindrical peripheral wall which is frictionally received within the peripheral wall of member 27. Member 24 has transverse, intumed, and flanges 24a and 24b, flange 24b being located inwardly of flange 24a. Said flange 24a is annular and abuts the inner face of flange 27a.

Disc 23 and an annular outer gas-tight gasket 25 are clamped together between flanges 24a and 24b and are received frictionally within the peripheral wall of member 24.

Sheath tube 29 extends longitudinally, the inner end of tube 29 being broken away. Said tube 29 extends through the central opening of flange 27b and has an out-turned, transverse, annular, outer end flange 29' located outwardly of flange 27b. Said flange 29' and a further annular gasket 28 are clamped between flange 27b and flange 24b, and extend frictionally within the peripheral wall of member 27.

Flange 24a has an opening which is offset with respect to the axis of tube 29. I provide a member 26 which includes a peripheral flange 26a which is integral with flange 24a. Said flange 26a extends outwardly of flange 24a and surrounds the opening of flange 24a.

Member 26 has an outer transverse end wall 26b. Longitudinally extending feeder tube 10 is located outwardly of wall 26b and extends into an opening of wall 26b. Tube 10 is fixed to wall 26b by any suitable means.

The flexible corrugated tube or bellows 22 extends axially with respect to tube 29 and is brazed into a central opening of disc 23. The interior space of tube 22 communicates with the interior space of member 26 and hence with the bore of tube 10, through the central opening 25a of gasket 25.

Combustion element 1 extends axially with respect to tube 29 and is elongated, the inner end of tube 1 being broken away. Combustion element 1 is porous and has an open inlet end for reception of combustion gases for passage of said gases through the wall of combustion element 1. The outer end portion of tube 1 is supported upon the inner end portion of tube 22. The inlet end of combustion element 1 is spaced inwardly of the inlet end of tube 22.

In order to provide for ignition of the combustion gases, a longitudinally extending tube 40 is extended through registering openings of disc 23, gasket 25 and flange 24a, said tube 40 being offset with respect to the axis of tube 22. The inner end of tube 40 is headed over at 40a, against disc 23. Outwardly of flange 24a, a clamping nut 41 is screwed onto the appropriately threaded tube 40 against flange 24a. Igniter element 30 is located within the bore of tube 29, with the leads 30a therefor being extended through tube 40 and outwardly thereof. Thermostat 31 is also located within the bore of tube 29 with the leads 31a therefor extended through tube 40 and outwardly thereof.

The metal tube 29 surrounds and is spaced from the periphery of element 1 to define an exhaust space 17 in which the combustion reaction takes place. As stated above, the inlet end of element 1 is spaced inwardly of the inlet end of tube 29. Tube 29 and disc means 23, 26, together with tube 22, serve as the mounting means for combustion element 1. It will be apparent that the disc means has through bore means (opening 25a of gasket 25 and the interior space of member 26) communicating with the bore of support tube 22. As stated above, the transverse corrugations of support tube 22 make it flexible so as to permit transverse movement of combustion element 1. It will further be apparent that the igniter means

30 are located inwardly of disc 23 but outwardly of the inlet end of combustion element 1, and within the space 17. It will further be noted that the supply means for the igniter means are extended through the wall of the mounting means for the combustion element for accessibility outwardly thereof. Accordingly, the igniter means 30 are located in the relatively cool zone outwardly of the inlet end of combustion element 1. This makes it possible for the igniter coil 30 to remain relatively cool once the combustion reaction is self-sustaining, so as to prevent the early destruction of the igniter element 30 by the heat of the combustion reaction.

While I have disclosed a preferred embodiment of the invention, and have indicated various changes, omissions and additions which may be made therein, it will be apparent that various other changes, omissions and additions may be made in the invention without departing from the scope and spirit thereof. Particularly, it will be apparent that any appropriate transverse disc means may be provided as support for the support tube 22.

I claim:

1. In combination, an elongated tubular, porous combustion element having an open inlet end for reception of combustion gases for passage of said gases through the wall of said combustion element, and mounting means for said combustion element, said mounting means for said combustion element comprising an elongated metal tube having an inlet end and surrounding and spaced from the periphery of said combustion element, the inlet end of said combustion element being spaced inwardly of the inlet end of said metal tube, disc means, means mounting said disc means transversely and sealingly on the inlet end of said metal tube, a hollow support tube fixed at one end thereof to said disc means and extending inwardly thereof, said disc means having through bore means communicating with the bore of said support tube, said support tube extending supportingly into the bore of said combustion element, said support tube being transversely corrugated so as to be flexible and thereby permit transverse movement of said combustion element, means for igniting said combustible gases in the space between said combustion element and said metal tube, means mounting said igniter means in the interior space of said mounting means for said combustion element adjacent the inlet

end of said metal tube and outwardly of the inlet end of said combustion element, and supply means for said igniter means extended through the wall of said mounting means for said combustion element.

2. In combination, an elongated tubular, porous combustion element having an open inlet end for reception of combustion gases for passage of said gases through the wall of said combustion element, and mounting means for said combustion element, said mounting means for said combustion element comprising an elongated metal tube having an inlet end and surrounding and spaced from the periphery of said combustion element, the inlet end of said combustion element being spaced inwardly of the inlet end of said metal tube, disc means, means mounting said disc means transversely and sealingly on the inlet end of said metal tube, a hollow support tube fixed at one end thereof to said disc means and extending inwardly thereof, said disc means having through bore means communicating with the bore of said support tube, said support tube extending supportingly into the bore of said combustion element, said support tube being transversely corrugated so as to be flexible and thereby permit transverse movement of said combustion element, means for igniting said combustible gases in the space between said combustion element and said metal tube, means mounting said igniter means on said disc means inwardly thereof and outwardly of the inlet end of said combustion element and in the space between said feeder tube and said metal tube, and supply means for said igniter means extended through said disc means for accessibility outwardly thereof.

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