

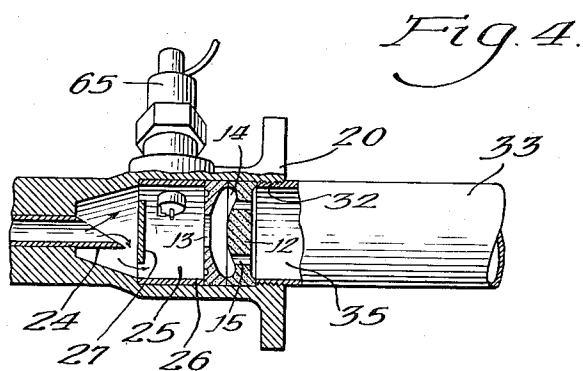
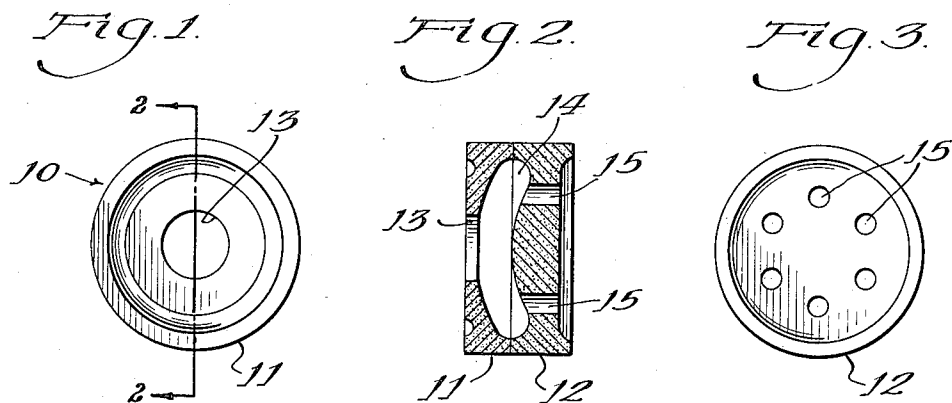
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REIGNITION MEANS FOR COMBUSTION HEATERS

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REIGNITION MEANS FOR COMBUSTION
HEATERS

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3 Claims. (Cl. 158—28)

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This invention relates to improvements in re-ignition means for combustion heaters.

Combustion heaters are generally provided with a sealed combustion chamber in communication with a suction line. A mixture of gasoline and air is drawn into the combustion chamber and means are provided to ignite the mixture as it passes into the combustion chamber. The combustion chamber is generally provided with radiator fins and blower to effect proper heat exchange.

Two separate ignition means are generally provided, one being a spark plug to effect ignition initially, and the other being a refractory member which, when heated to incandescence, serves as a re-igniting means, and permits the spark plug circuit to be turned off. In other words, the flame is generally self-sustaining, but when momentary flame failure occurs, re-ignition is effected by the refractory member, except during an initial starting period during which it is brought up to ignition temperature, and during this starting period, a spark plug performs the ignition. Such refractory member is referred to as a re-ignition means or device.

It is an object of my invention to provide a re-ignition means comprising a refractory member of improved design which provides greater surface contact with the fuel mixture than that provided by prior art devices, and which also serves to break up the gas passing therethrough into a plurality of separate streams, thereby providing more complete combustion.

A further object of my invention is to provide a refractory re-ignition means having a longer life than the prior art devices. In this connection, I have found that a laminated structure is less subject to cracking and will result in a much longer life for the refractory member.

A still further object of my invention is to provide an improved refractory member which provides a hot spot on which unvaporized droplets of fuel may impinge in order to cause vaporization thereof, before passing on to the zone of combustion.

Various other objects, features and advantages will become apparent as the description proceeds.

References hereby made to the accompanying drawings which form a part of this specification, and in which a preferred embodiment of this invention is illustrated, like reference numerals referring to like parts:

Fig. 1 is a front view of a preferred embodiment of this invention;

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Fig. 2 is a sectional elevation taken along line 2—2 of Fig. 1;

Fig. 3 is a rear view of the re-ignition means shown in Fig. 1; and

Fig. 4 is a sectional view illustrating the manner in which the re-ignition means may be used.

With reference now to the drawings, the reference numeral 10 designates generally the refractory re-ignition means. It comprises two discs 11 and 12 of refractory material which are positioned side by side. The disc 11 is provided with a circular perforation 13 and is undercut peripherally to form an annular cavity as indicated by the reference numeral 14. The disc 12 is provided with a plurality of peripherally arranged perforations 15 to form passageways communicating with the cavity 14.

Fig. 4 is a sectional view of a portion of a combustion heater which shows the manner in which the refractory re-ignition means may be used. The portion of the heater shown comprises a boss 20, into one end of which is screw threaded a tube 33 which forms a combustion chamber 35. The boss 20 is drilled to receive an inlet tube 24 which extends into a larger cavity formed within the boss, which cavity may be referred to as the ignition chamber 25. A heat resistant cup-shaped member 26, the closed end of which is perforated so as to provide a baffle 27, is fitted into the re-ignition chamber. Refractory re-ignition means 10 is positioned adjacent the open end of the cup-shaped member 26. The bore in the boss 20 is threaded as indicated at 32 to receive the tube 33 which confines the cup-shaped member 26 and the ignition means 10 in position.

A spark plug 65 is mounted in the wall of the ignition chamber 25 so that the carburetted gasoline which is drawn into the ignition chamber may be ignited. The burning mixture then passes through the passageways in the discs 11 and 12 and further combustion takes place in the combustion chamber 35. After combustion continues for a short period of time, the refractory discs 11 and 12 become heated to the state of incandescence so that the ignition provided by the spark plug 65 is no longer needed. Suitable means may be provided for breaking the circuit to the spark plug when this state has been attained. It will be noted in this connection that the combustible mixture in passing from the ignition chamber 25 into the combustion chamber 35 is exposed to heat radiated from all directions due to the undercut construction of the discs 11 and 12, and some of the heat

so radiated is absorbed by the combustible mixture. Furthermore, any unvaporized droplets of gasoline, having a greater inertia than the vapor, will impinge upon the central portion of the disc 12 and will be vaporized before passing through the perforations 15 into the combustion chamber. The construction herein illustrated has been found to form a highly efficient means of ignition.

It will be noted that only the central portion of the disc 12 will be exposed to the full force of the flame, the periphery of this disc being shielded by the disc 11, which is annular in shape. This shielding effect provided by the ring-shaped member causes less stress to be imposed upon the second disc as it is initially heated up, and similarly the stress on the ring-shaped member is much less than it would be if this member were not perforated centrally and provided with a centrally tapering cross section. Therefore, by using a combination of two discs, it has been found that they break much less frequently than when only a single refractory disc is used. After the discs have been heated to an incandescent state, the spark plug circuit is automatically opened, and the mixture when necessary is re-ignited as it passes through the refractory discs 11 and 12.

This application is a division of my copending application, Serial No. 469,668, filed December 21, 1942, now Patent No. 2,457,862, granted January 4, 1949, and the subject matter thereof, insofar as it is consistent with this application, is hereby incorporated by reference into this application.

Although only a preferred modification of this invention has been shown and described herein, it will be understood that various modifications and changes may be made therein without departing from the spirit of this invention. It is understood that the foregoing is intended to be illustrative only, and that this invention is to be limited only by the following claims.

I claim:

1. In a combustion heater, the combination of means forming an ignition chamber, means forming a combustion chamber disposed adjacent thereto, means for supplying a mixture of fuel particles and air forwardly into said ignition chamber, and re-ignition means comprising a refractory device provided with a plurality of peripherally arranged passageways, said device being disposed forwardly of said supplying means and separating said chambers, the central portion of said refractory device being unperforated, said refractory device including an annular portion overhanging the entrance to said passageways but not said central portion whereby said particles of unvaporized fuel will impinge upon said central

portion and will be vaporized by contact therewith before moving radially outward to the entrance of said passageways.

2. In a combustion heater of the type described, the combination of means forming an ignition chamber, means for supplying a mixture of fuel particles and air forwardly into said ignition chamber, means forming a combustion chamber, and a re-ignition device disposed forwardly of said supplying means and separating said chambers, said device comprising a refractory disc having a plurality of peripherally arranged passageways and a separate refractory ring-shaped member disposed adjacent thereto and overhanging the entrance to said passageways, the disc and ring-shaped member being hollowed out to provide an annular cavity in communication with said passageways and open centrally for communication with said ignition chamber so that as the mixture passes from said ignition chamber into said passageways it will be exposed to radiation from the walls of said annular cavity.

3. In a combustion heater of the type described, the combination of means forming an ignition chamber, means for supplying a mixture of fuel particles and air forwardly into said ignition chamber, means forming a combustion chamber, and a refractory device disposed forwardly of said supplying means and separating said chambers, said device being provided with a plurality of peripherally arranged passageways, the central portion thereof being unperforated, such device including a portion overhanging the entrance to said passageways to provide an annular cavity in communication with said passageways whereby particles of unvaporized fuel will impinge upon said central portion and will be vaporized by contact therewith before moving radially into said cavity, the construction of said cavity being such that the radiation from a substantial portion of incandescent surface is directed upon all the mixture as it passes from said ignition chamber into said combustion chamber.

THEODORE S. BRISKIN.

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