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R. H. GODDARD
IGNITION APPARATUS FOR COMBUSTION CHAMBERS
USING INTERMINGLED COMBUSTION LIQUIDS
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2,498,263

Fig. 1.

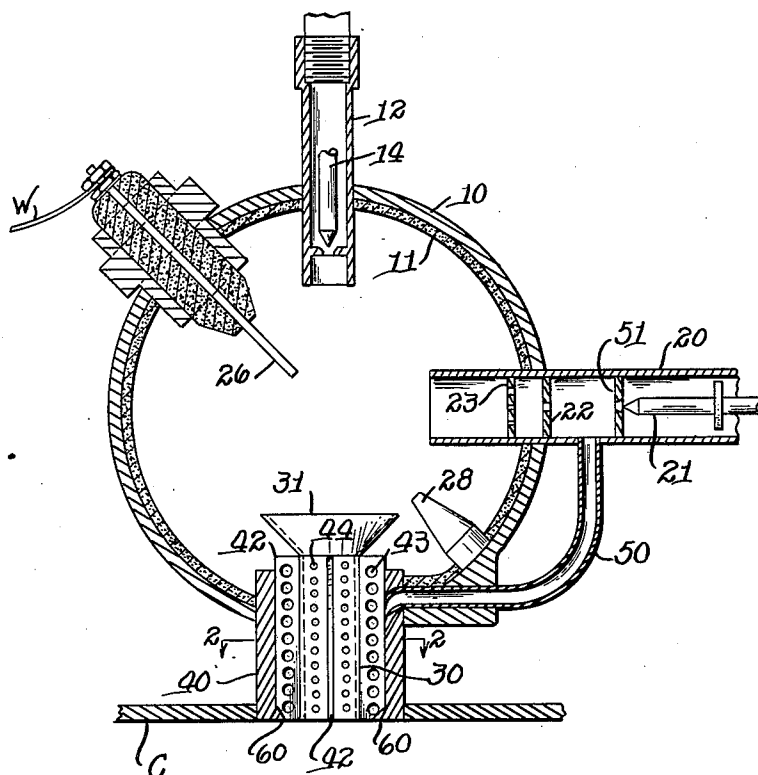


Fig. 3.

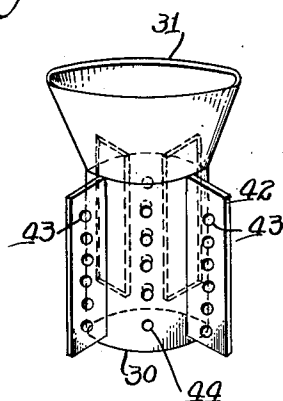
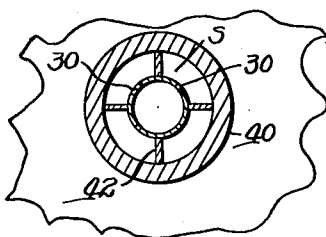


Fig. 2.

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UNITED STATES PATENT OFFICE

2,498,263

IGNITION APPARATUS FOR COMBUSTION CHAMBERS USING INTERMINGLED COMBUSTION LIQUIDS

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2 Claims. (Cl. 158—28)

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This invention relates to ignition apparatus of the general type shown in the prior patent to Robert H. Goddard No. 2,090,039, issued August 17, 1937. In said patent, means is provided for by-passing a portion of liquid oxygen to a combustion chamber at a point adjacent the disclosed ignition apparatus to assist in maintaining the igniting flame within the combustion chamber.

It is the general object of the present invention to improve the by-pass delivery of oxygen shown in said prior patent, with the intention that the igniting flame may be more effectively maintained and that accidental extinguishing of the flame may be avoided.

To the accomplishment of this general object, an important feature of the invention relates to the provision of an annular passage around the igniting tube, together with means to by-pass liquid oxygen to said passage and with means to supply portions of said by-passed oxygen to the igniting flame as the flame traverses the igniting tube.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a sectional elevation of the improved ignition apparatus;

Fig. 2 is a sectional plan view, taken along the line 2—2 in Fig. 1; and

Fig. 3 is a perspective view of the igniting tube and of certain associated parts.

Referring to Fig. 1, ignition apparatus is shown comprising a spherical casing 10 having a refractory lining 11. A liquid fuel, such as gasoline, is fed to the ignition apparatus through a pipe 12, and the rate of flow may be controlled by the setting of a valve rod 14. An oxidizing liquid, such as liquid oxygen, is supplied to the apparatus through a second pipe 20, and the rate of flow is controlled by the setting of a second valve rod 21.

Baffle plates 22 and 23 in the pipe 20 break up the stream of liquid oxygen, so that the oxygen enters the ignition apparatus in the form of a fine spray.

The intermingled combustion elements may be

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ignited by an electric spark developed between terminals 26 and 28 within the casing 10, the terminal 28 being grounded and the terminal 26 being insulated and connected to an ignition wire W.

The flame thus generated in the casing 10 is projected into the combustion chamber C through an igniting tube 30 having a funnel-shaped entrance portion 31.

The igniting tube 30 is mounted within a sleeve 40 projecting outward from the wall of the combustion chamber C and supporting the casing 10 of the ignition apparatus. The igniting tube 30 is held in spaced relation with the supporting sleeve 40 by longitudinal vanes or partitions 42 which are each provided with a plurality of transverse holes or openings 43. Additional openings 44 (Fig. 3) are provided in the tube 30 between each two adjacent vanes 42.

A pipe 50 is connected at its upper end to the oxygen feed pipe 20 at a point between a valve plate 51 in the pipe 20 and the baffle or spray plate 22. At its lower end, the pipe 50 is connected to the annular space S between the tube 30 and the sleeve 40.

The oxygen thus by-passed and delivered to the space S circulates around the tube 30 through the openings 43, and a substantial portion of this liquid oxygen is delivered through the holes 44 to the interior of the igniting tube 30, where it continues the combustion of any unconsumed fuel in the igniter flame.

At its lower end, the sleeve 40 is preferably inwardly flanged as indicated at 60, so that any remaining oxygen in the space S which is discharged into the combustion chamber will be directed toward the axis of the igniting tube 30, thus engaging the igniting flame and insuring continuous burning thereof within the chamber C.

By this construction, accidental extinguishing of the igniting flame, either in the igniting tube 30 or as it enters the chamber C, is very effectually avoided.

Having thus described the invention and the advantages thereof, it will be understood that the invention is not to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what is claimed is:

1. In combustion apparatus, a wall forming a combustion chamber, ignition apparatus for said

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combustion chamber comprising an igniting tube communicating through said wall, means to provide an igniting flame delivered through said tube to said chamber, a sleeve providing an annular passage around said igniting tube, which passage is freely open to said combustion chamber at its inner end, means to hold said tube and sleeve in concentric spaced relation, said tube having a plurality of transverse perforations therein for delivery of a portion of liquid oxygen from said passage to said igniting flame within said tube, and means to supply liquid oxygen to said annular passage for delivery into said tube and also direct to said combustion chamber.

2. The combination in combustion apparatus as set forth in claim 1, in which said sleeve has an inwardly directed flanged portion at its inner and lower end by which any liquid oxygen reaching the open lower end of the annular passage

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is directed toward the axis of said tube and into the path of the igniting flame within said combustion chamber.

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Robert H. Goddard, Deceased.

REFERENCES CITED

10 The following references are of record in the file of this patent:

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2,373,766	McColium	Apr. 17, 1945
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