Sept. 19, 1950

R. H. GODDARD
INTERMITTENT FEED MECHANISM
FOR COMBUSTION CHAMBERS
Filed Nov. 1, 1947

2,523,012

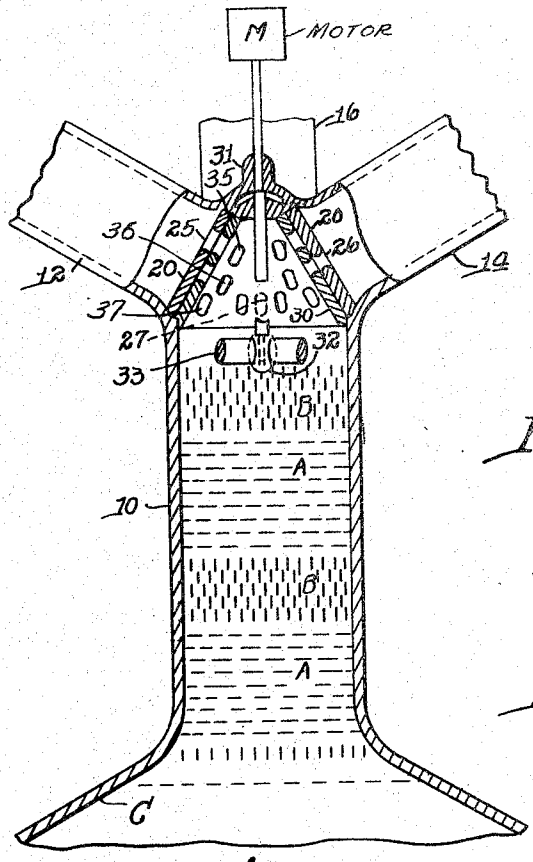


Fig. 1.

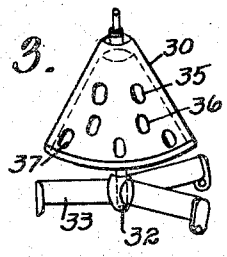


Fig. 3.

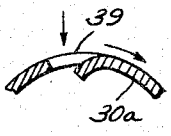


Fig. 4.

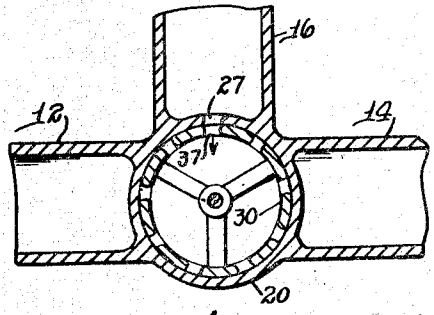


Fig. 2.

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Patented Sept. 19, 1950 2,523,012

UNITED STATES PATENT OFFICE

2,523,012

INTERMITTENT FEED MECHANISM FOR COMBUSTION CHAMBERS

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Application November 1, 1947, Serial No. 783,595

3 Claims. (Cl. 60—46)

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This invention relates to combustion apparatus in which intermittent feed is provided for two combustion liquids, as gasoline and liquid oxygen and is a continuation in part of prior Goddard application Serial No. 522,101 filed February 12, 1944, and relates to divisional subject matter thereof. In such apparatus, as shown for example in the prior Goddard Patent #2,409,036, successive small amounts of two different combustion liquids are fed to a combustion chamber and are successively detonated. This produces a rapid succession of relatively small explosions which simulate continuous combustion but with avoidance of dangerous and violent explosions.

It is the general object of the present invention to provide improved and simplified mechanism for effecting such intermittent feed and for alternately introducing portions of a neutral liquid. A further object is to provide a mixing chamber in which the combustion liquids may be effectively intermingled in small quantities and between interposed portions of a neutral liquid.

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 drawing, in which:

Fig. 1 is a sectional side elevation showing the improved construction but with the motor drive shaft broken away for clearness;

Fig. 2 is a somewhat diagrammatic sectional plan view of a rotating valve and associated parts;

Fig. 3 is a perspective view of said rotating valve and its supporting bearings; and

Fig. 4 is a detail sectional view to be described.

Referring to Figs. 1 to 3, the upper portion of a combustion chamber C is provided with a tubular extension 10, to the upper end of which supply pipes 12, 14 and 16 are connected. The pipe 12 may supply gasoline, the pipe 14 may supply liquid oxygen, and the pipe 16 may supply water.

The inner ends of the pipes 12, 14 and 16 are closed by a conical partition 20 having an upper port 25 opening out of the pipe 12, an intermediate port 26 opening out of the pipe 14, and a lower port 27 opening out of the pipe 16.

A conical valve member 30 is supported in upper and lower bearings 31 and 32 and rotates within the conical partition 20. The lower bearing 32 is preferably supported on a plurality of radial arms 33 (Fig. 3).

The valve member 30 is hollow and is provided with an upper annular series of ports 35, an

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intermediate series 36 and a lower series 37. The ports 35 and 36 are preferably disposed in diametrically opposite aligned pairs as shown in Fig. 3, and the ports 37 are diametrically disposed and alternate with the pairs of ports 35 and 36. The valve member 30 may be rotated at relatively high speed in any convenient manner as by a motor M.

The partition ports 25, 26 and 27 and the valve ports 35, 36 and 37 are so disposed and related that, as the valve member 30 rotates, the partition ports 25 and 26 for gasoline and liquid oxygen will be simultaneously uncovered, while at the same time the port 27 for water will be closed.

Very small portions of the two combustion liquids will thus be injected successively and under pressure from opposite sides of the chamber extension 10 and will be intermingled as they pass downward in said extension.

Each such injection of portions of the two combustion liquids is immediately followed by the injection of a portion of water or other neutral liquid through the partition port 27 and one of the valve ports 37, the port 27 being uncovered as the ports 25 and 26 are closed by further rotation of the valve member 30. A portion of water is thus interposed between each two successive charges of the combustion liquids.

The spaces containing combustion liquids are indicated by horizontal lining at A in Fig. 1 and the spaces containing the neutral liquid are indicated by vertical lining at B.

Successive charges of combustion liquids are thus separated from each other by interposed portions of neutral liquid as the charges pass downward along the tubular extension 10 to the combustion chamber C, where they are then ignited or detonated by the residual heat of the combustion chamber.

If the ports in the rotating valve member 30*a* are formed as indicated at 39 in Fig. 4, the reaction of the entering liquids will automatically effect rotation of the valve member 30*a* and the motor M may be omitted.

The intermittent feed mechanism herein shown may be simply and easily constructed and is particularly effective for its intended purposes.

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. Intermittent feeding mechanism for a combustion chamber comprising a tubular premixing extension of said combustion chamber at the

entrance end thereof, feed pipes to supply two different liquids and a neutral liquid to said tubular extension, a rotated hollow valve member having two rows of axially aligned valve openings, one row for each combustion liquid, and having a third row of valve openings for said neutral liquid, and means to continuously rotate said valve member to uncover the openings of said third row alternately with the openings of said first two rows, thereby admitting a small portion of said neutral liquid to said premixing extension between each two successive admissions of combustion liquids from said first two rows of valve openings.

2. Combustion apparatus comprising a fixed combustion chamber, means to supply combustible, oxidizing and inert liquids thereto, a hollow conical valve member controlling the flow of all of said liquids, and means to continuously rotate said valve to periodically interrupt the flow of the combustible and oxidizing liquids and to simultaneously provide flow of the inert liquid through said valve.

3. Combustion apparatus comprising a fixed combustion chamber, means to supply combustible, oxidizing and inert liquids thereto, and a hollow conical valve member controlling the flow of all of said liquids, and said conical valve member having ports with inwardly offset edge portions, whereby the flow of liquids through said ports effects rotation of said valve member to periodically interrupt the flow of the combustible and oxidizing liquids and to simultaneously provide flow of the inert liquid.

ESTHER C. GODDARD,
Executrix of the Last Will and Testament of Robert H. Goddard, Deceased.

REFERENCES CITED

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

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Number	Name	Date
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