March 24, 1959 F. G. PARIS ET AL 2,878,790

INTERMITTENT COMBUSTION BOILER

Filed Nov. 4, 1955

Fig. 1

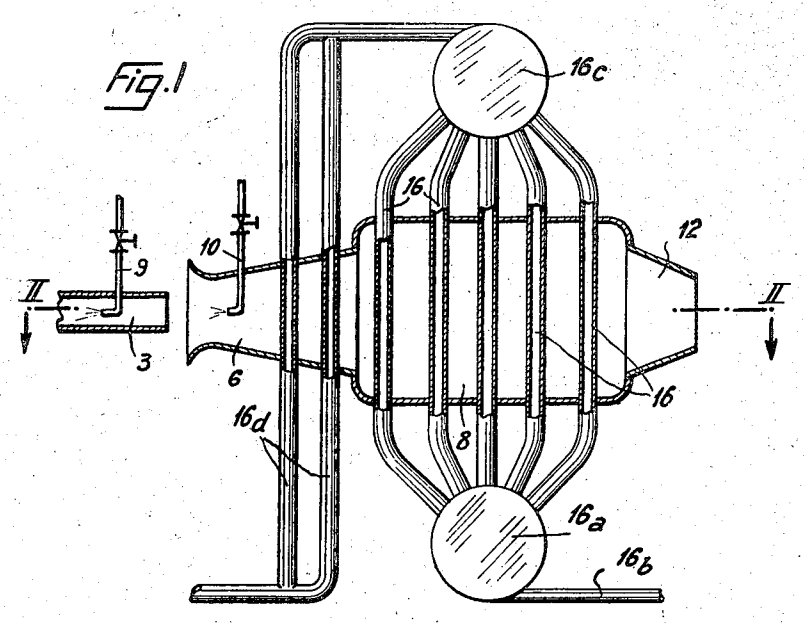
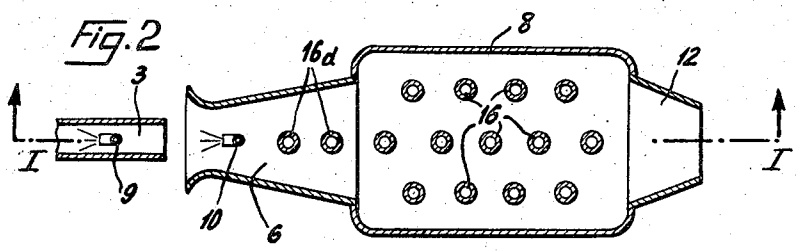


Fig. 2



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United States Patent Office

2,878,790

Patented Mar. 24, 1959

2,878,790

INTERMITTENT COMBUSTION BOILER

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Application November 4, 1955, Serial No. 545,095

Claims priority, application France November 10, 1954

1 Claim. (Cl. 122—24)

Pulsatory combustion chambers of the type used in pulse-jet units and which operate in accordance with a constant-volume cycle, have already been proposed as furnaces for boilers.

By reason of the high temperature of the gases discharged from a pulsatory combustion chamber, it has also been proposed to cause its exhaust nozzle to discharge into an ejector unit which induces a current of fresh air which mixes with the gases, with a view to reducing their temperature when they are used for direct heating, for example for heating the engines of automobiles or of aircraft, which have to be started up in cold weather.

The invention starts-off from a contrary principle, and consists in using the fresh air set in motion inside an ejector by the puffs of exhaust gas, in order to burn inside the said ejector or inside a chamber which follows it, an additional quantity of fuel introduced through one or a number of injectors, which enables the quantity of calories liberated by the apparatus to be increased to a very substantial extent.

The description which follows below with respect to the attached drawings (which are given by way of example only, and not in any sense by way of limitation) will make it quite clear how the invention may be carried into effect, the special features which may be brought out either in the drawings or in the text, being understood to form a part of the said invention.

Figs. 1 and 2 are two axial cross-sections at 90° with each other, of a form of boiler, Fig. 1 being taken on line I—I of Fig. 2 and Fig. 2 being taken on line 2—2 of Fig. 1.

The arrangement illustrated in the drawings comprises

a pulse-jet unit whose exhaust pipe, shown at 3, discharges into a convergent-diverget ejector 6 leading into a chamber 8 opening into the atmosphere through a passage 12. Fuel injectors 9 and 10 are located respectively in the exhaust pipe 3 and ejector 6.

The drawings show a form of construction of boiler in which the steam is produced in water tubes 16 which pass through the chamber 8 and the ejector 6. In the drawing, there has been shown diagrammatically a lower water chamber 16*a* which receives the feed water at 16*b* and from which pass the tubes 16 terminating at their upper extremities in a steam chest 16*c*. The steam is then superheated in the tubes 16*d* which pass through the ejector 6. Tubes may also be provided for heating the feed water.

What we claim is:

A boiler comprising a pulse jet unit having a discharge pipe, a convergent-divergent duct having an inlet opening facing toward said discharge pipe but spaced therefrom, said duct forming with said pipe an ejector adapted to suck ambient air when energized by the pulses of combustion gas issuing from the pulse jet unit, a wall extending said duct on the downstream side thereof and bounding a chamber communicating at one end with said duct and at the other end with the atmosphere, fuel injecting means for carburetting the mixture of air and gas formed by said ejector, piping means in the chamber for circulating liquid in heat exchange relation therewith, means connected with said piping means for collecting vapor generated therein, and further piping means connected with said collecting means and extending through the convergent-divergent duct.

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