PATENT SPECIFICATION

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402,429

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Complete Accepted: Dec. 1, 1933.

COMPLETE SPECIFICATION.

Improvements in or relating to Means for Propelling a Moving Body through a Fluid Medium.

I, HENRI MAINGUET, of 10, rue Garanciere, Paris, France, a French Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to means for propelling a moving body through a fluid medium by utilising the rearward discharge of gases resulting from the combustion of suitable fuel or explosive, and is more particularly concerned with the propulsion of moving bodies which move in air, such as for example, aircraft, dirigibles, projectiles, road vehicles, and the like.

A type of propeller is known, constituted by true rockets with fuel, wherein the gases resulting from the combustion escape at a very high speed, at the rear portion of the body, through one or more orifices; so as to propel the body in the direction opposite to that of the exhaust.

In projectiles it has also been known to discharge gases rearwardly from a small cap at the front of the projectile which is in the form of a cylinder at the rear of the cap.

The object of the invention is to increase the efficiency of the propeller.

According to the invention, means for propelling a moving body in a fluid medium, particularly air, by utilising the rearward discharge of gases resulting from the combustion of suitable fuel or explosive, wherein the body is of stream line shape having a blunt nose portion terminating at the plane of maximum cross section of the body and a tapering rear portion, is characterised in that the escape of the gases used for propulsion takes place in the neighbourhood of the said plane of maximum cross section and rearwardly from a cap enclosing the nose of the body and extending as far as the said plane, the cap directing the gases, which escape at great speed, along the tapering sides of the body, whereby in addition to a rocket action impelling the body forwardly, there is produced a vacuum at the front and a compression action at the rear of the body augmenting the efficiency and forward movement thereof.

The gases irrespective of their nature, may be the exhaust gases from a burner which may be constituted for the combustion of an explosive or of a liquid. In the latter case the burner may be a suitable engine, such as for example, a Diesel engine, burning heavy oil.

The accompanying drawing illustrates diagrammatically by way of example, propellling means constructed according to the characteristic arrangements of the present invention.

Fig. 1 recalls the known arrangement of an ordinary rocket;

Figs. 2 and 3 recall diagrammatically the known arrangement of two bodies each mounted on four wheels and propelled by a rear exhaust;

Figs. 4 to 10 are views of bodies propelled according to the characteristic means of the present invention.

In Fig. 1, 1 indicates the body of the rocket and 2 the gases escaping in the direction of the arrow f, opposite to the direction of movement f^1 of the rocket, provided with a supporting shaft 3. In this case the propulsion takes place by the reaction of the gases on the surrounding air which creates a counter pressure to the rear of the rocket.

In the device illustrated in Figs. 2 and 3, the exhaust gases escaping in the direction of the arrow f again create a counter pressure at the rear of the body 1 which produces, by reaction, its movement in the direction of the arrow f^1.

Fig. 4 shows a body 1, having a stream line shape according to the outline of a good projectile; at the front of this projectile is provided a hemispherical cap 5 enclosing the nose of the body and extending as far as the plane of maximum cross-section thereof; at the rear of the body are provided crossed tails 3 and 4 which ensure the stability of the body in its trajectory. The exhaust gases escape at 2, in the direction of the arrow f, through orifices or jets disposed in the annular portion a—a in the plane of maximum cross-section. The body,

under these conditions, moves in the direction of the arrow f^1 and the gases which escape at a high speed (greater than that of the movements), along the tapering sides of the body, plus the rocket action produced by their reaction on the surrounding medium, create at the front a vacuum and at the rear a counter pressure, or a compression action by reason of the expansion of the gases along the sides of the body, the one and the other having an action in the same direction on the body so as to propel it in the direction f^1 and appreciably increase the efficiency of the propelling means.

Fig. 5 shows a sectional view of such a body; at 7 there is provided a burner containing the fuel which produces the gases; this may be, for example, the charge of a rocket, which, ignited by any means, wick, percussion cap, electric spark, etc., disengages gases which are diverted at 8 so as to escape towards the rear from the jet in the plane *a—a*; 6 is the tapering rear portion of the body which contains, for example, either fuel for feeding the burner 7, or an explosive in the case of a shell.

Fig. 6 illustrates in section, a moving body propelled by gases derived from the combustion of a liquid such as a heavy oil; at 7^1 there is a burner, fed, by any one of known means, with atomised oil and air in suitable proportions and at a suitable pressure; the ignition may be obtained by a plug, electric resistance, etc.; the gases are also diverted at 8 so as to escape tangentially from the jets in the plane *a—a* along the sides of the body. For starting, the supply of air to the burner may be furnished by a compressor, a compressed air cylinder, etc., and when the body has reached a particular speed the air may be furnished by a container, constructed normally relatively to the direction of operation and giving a suitable supply at a pressure which is a function of the speed.

It will be understood that the members illustrated in Fig. 6 need only constitute a portion of the body. This latter, as shown diagrammatically in Fig. 10, may, for example, be an aeroplane with its propelling means including the tapered portion at 6, its tail surfaces 3 and 4, its pilots car 16 and its wings 17. In this case the container for receiving the air may be placed at any suitable point of the car or at the front of the cap 5 of the propelling means as shown in Fig. 6 and in Fig. 7, which is a front view corresponding with Fig. 6.

In these figures, 9, indicates the container, 10 the passage connecting the container to the burner, in Fig. 6, there is shown at 11 the direction of circulation of the air which in this case is directed in a suitable manner towards the members of the burner which produce the atomisation and vaporisation of the oil on the one hand and the suitable mixing with air on the other hand. These known members are not illustrated in the accompanying drawing, they are assumed to be disposed in the interior of the body 6 but they may also be on the outside, and for example in the car 16 of the aeroplane shown in Fig. 10.

In Fig. 6 the air which arrives at 11 passes through tubes which themselves pass through the combustion zone; it is thus preheated which is of advantage for the efficient operation of the burner.

Figs. 8 and 9 show another modification in which the gases used for the propulsion are the exhaust gases of an engine 18 assumed, in the example illustrated, to have three cylinders mounted in the form of a star.

This engine may be a two-stroke engine, of the Diesel cycle; at 14 are located the exhaust valves and at 15 the air admission orifices.

At the end of the stroke the air admitted into the cylinder being compressed, the heavy oil is injected into the chamber; there is combustion and on the return stroke, at a suitable moment, the exhaust valve is opened with a considerable advance on the normal cycle; the exhaust gases escape at 14 so as to follow the direction indicated at 8 in the drawing. The piston continuing its downward stroke uncovers the air admission orifices 15; the air compressed in the container 9, by reason of the speed of the body, enters at 15, scavenges the cylinder of burnt gases and the piston, during its upward stroke, closes the orifices 15 thus compressing the air, and the cycle is recommenced.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. Means for propelling a moving body in a fluid medium, particularly air, by utilizing the rearward discharge of gases resulting from the combustion of suitable fuel or explosive wherein the body is of stream line shape having a blunt nose portion terminating at the plane of maximum cross section of the body and a tapering rear portion, characterised in that the escape of the gases used for propulsion takes place in the neighbourhood of the said plane of maximum cross section and rearwardly from a cap enclosing the nose of the body and extending

as far as the said plane, the cap directing the gases, which escape at great speed, along the tapering sides of the body, whereby in addition to a rocket action impelling the body forwardly, there is produced a vacuum at the front and a compression action at the rear of the body augmenting the efficiency and forward movement thereof.

2. Means for propelling a moving body according to Claim 1, including a container in the front of the cap, collecting compressed air for delivery to a burner producing the gases, constructed, arranged and operating substantially as described and as illustrated in the accompanying drawing.

Dated this 1st day of June, 1932.

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27, Chancery Lane, London, W.C. 2,
Agents for the Applicant.

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Fig.1

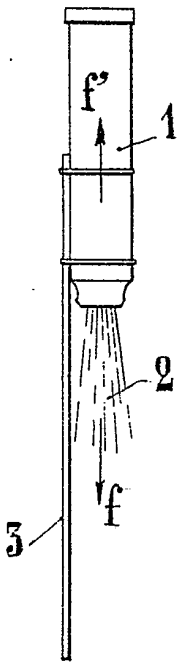

Fig.2

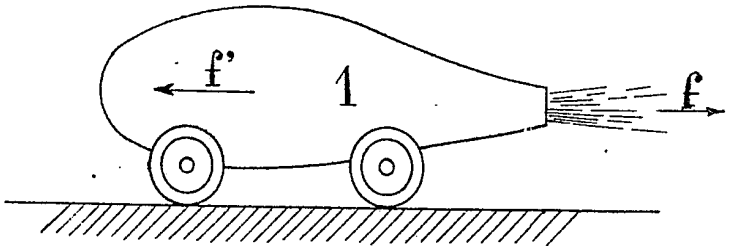

Fig. 4

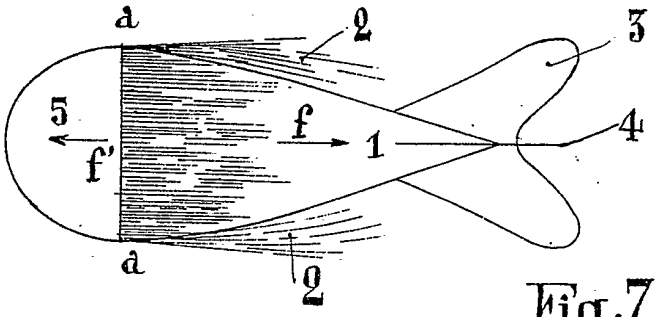

Fig.7

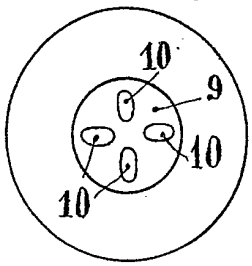

Fig.6

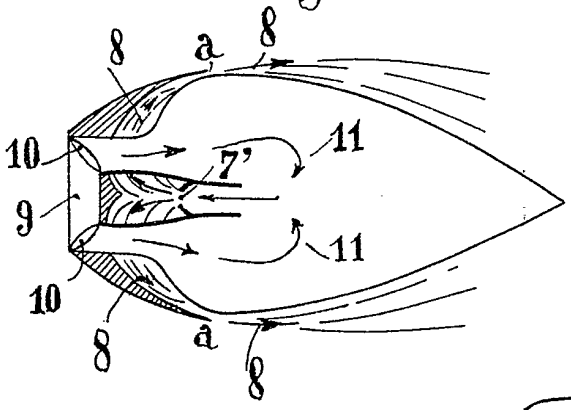

Fig. 10

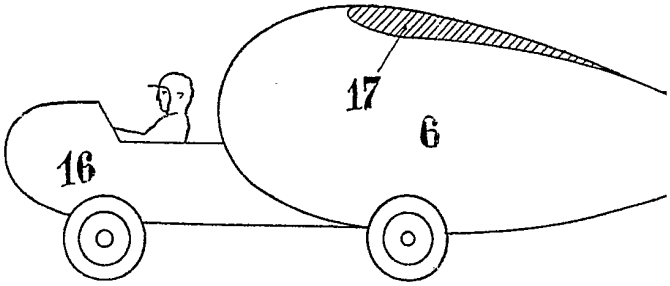

Fig.3

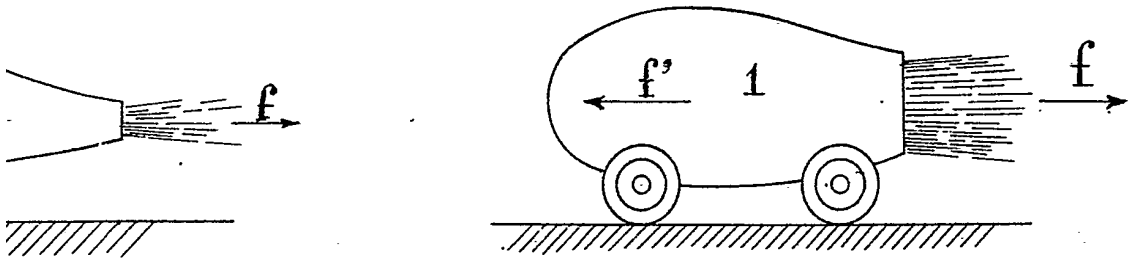

Fig.5

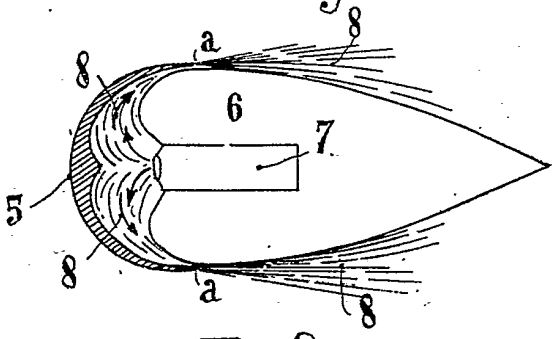

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Fig.7

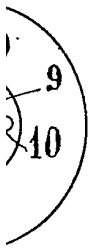
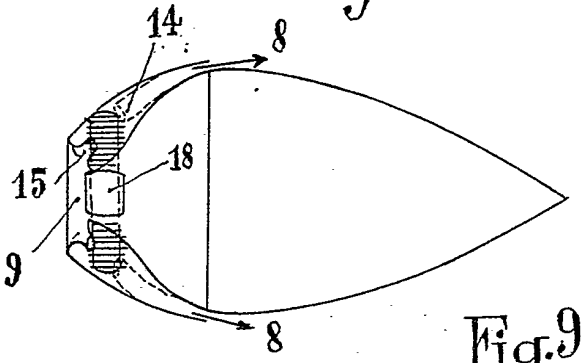


Fig.8



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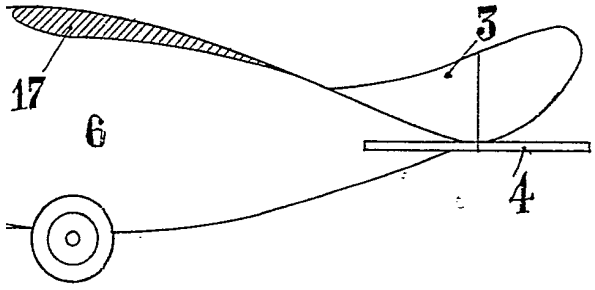

Fig.9

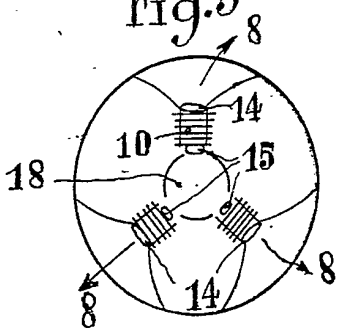

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Fig.1

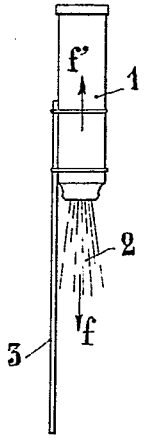


Fig.2

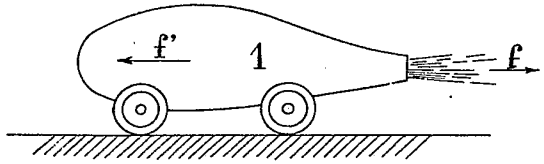


Fig.3

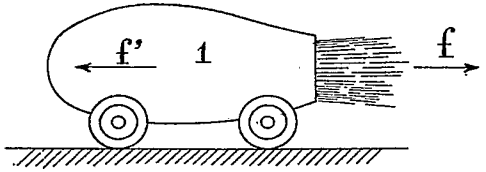


Fig.4

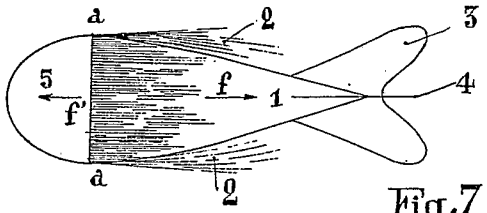


Fig.5

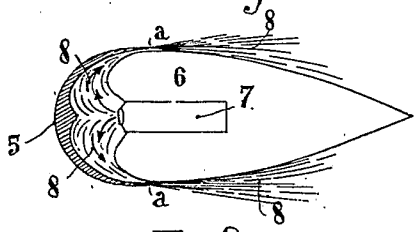


Fig.7

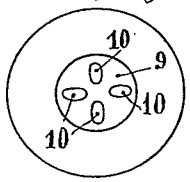


Fig.8

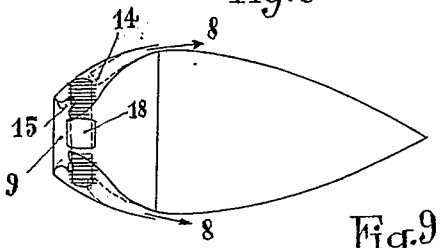


Fig.6

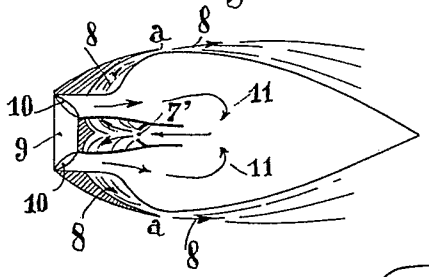


Fig.10

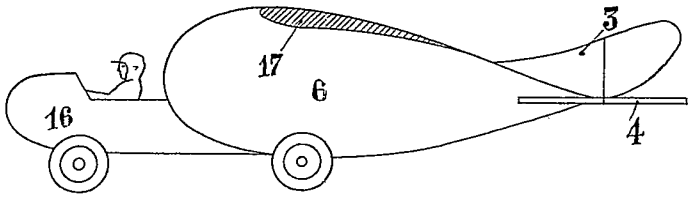
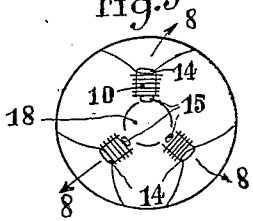


Fig.9



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