

N° 26,549



A.D. 1909

(Under International Convention.)

Date claimed for Patent under Patents and Designs Act, 1907, being date of first Foreign Application (in France), } 23rd Nov., 1908

Date of Application (in the United Kingdom), 16th Nov., 1909

At the expiration of twelve months from the date of the first Foreign Application, the provision of Section 91 (3) (a) of the Patents and Designs Act, 1907, as to inspection of Specification, became operative

Accepted, 21st July, 1910

COMPLETE SPECIFICATION.

Improvements in or connected with Motors especially applicable to Aviation and Aerostation Purposes.

We, L. DUTHEIL, R. CHALMERS AND COMPANY, of 81 and 83, Avenue d'Italie, Paris, in the Republic of France, Engineers, 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:—

5 This invention relates to an internal combustion motor of the type in which two pistons work in a single cylinder and respectively actuate in opposite directions a crank shaft at each end of the cylinder. In connection with such type of motor it has hitherto been proposed to transmit the motor power through a lay shaft (being part of the motor) connected by bevil gearing to the crank shafts of the motor, *v.e.* the drive being from the lay shaft.

10 The motor constructed according to our invention applies especially to aviation and aerostation purposes and has two crank shafts revolving in opposite directions on each of which shafts is mounted a screw propeller, or to each of which shafts a screw propeller is directly coupled by means of a simple or universally jointed propeller shaft.

15 In aeroplanes and aerostats hitherto constructed having two or more propellers it has been necessary in order to enable the propellers to be placed at the required distance apart to employ auxiliary shafts to which the propellers are attached, such auxiliary shafts being geared to the shafts of the motor.

20 By the means provided by constructing motors according to this invention the propellers are rotated in opposite directions without the necessity of employing a drive through intermediate gearing or otherwise than directly from the motor shafts. In this way weight of parts and loss of power are avoided.

25 The accompanying drawing represents, diagrammatically, a vertical section through the cylinder, or one of the cylinders, of a horizontal motor constructed according to this invention.

a is a cylinder in which move two pistons *c d*, the piston *c* being connected by means of the rod *e* to the pin of the crank *i* of the shaft *g*, the piston *d* being connected by means of the rod *f* to the pin of the crank *b* of the shaft *h*.

30 The combustible charge is exploded between the pistons which are forced

[Price 8d.]



Improvements in or connected with Motors.

outwards by the expansion of the burning gases and rotate the crank shafts *g* and *h* in opposite directions.

To ensure the synchronic movement of the crank shafts in opposite directions they are connected together by bevil gearing, as shown, or the two shafts may be connected together by a train consisting of an even number of spur wheels or by a crossed chain belt. 5

Although not shown in the drawing, on each crank shaft is secured a screw propeller, one propeller being right handed and the other propeller left handed.

The motor may consist of any suitable number of cylinders side by side.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:— 10

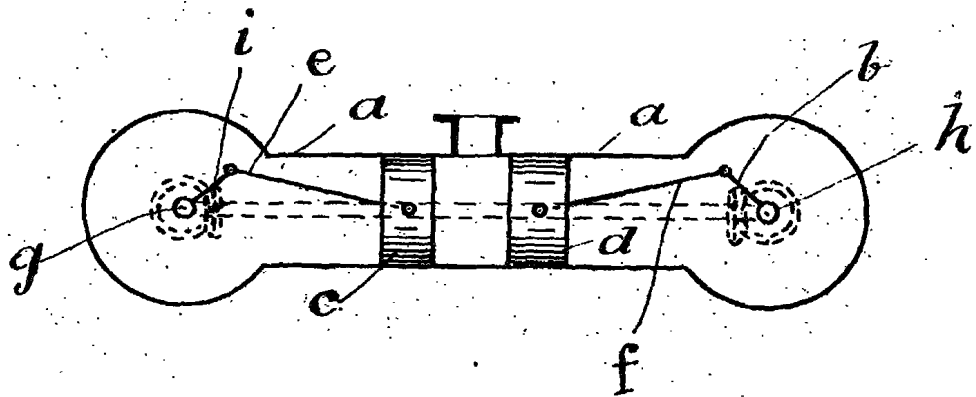
1. A motor for aviation and aerostation having two pistons working in a cylinder, a crank shaft at each end of the cylinder to each of which shafts is secured a screw propeller, each shaft being driven direct by its own piston and connecting rod and operating as a direct drive from the crank shaft for its propeller, and gearing to compel both crank shafts to rotate at the same speed in contrary directions as specified and for the purpose stated. 15

2. A motor for aviation and aerostation having two or more cylinders and two pistons working in each cylinder, a crank shaft at each end of the cylinders to each of which shafts is secured a screw propeller, connecting rods to directly connect one of the crank shafts to one set of pistons and to connect the other crank shaft to the other set of pistons operating as a direct drive from the crank shafts for the propellers, and gearing to compel both crank shafts to rotate at the same speed in contrary directions as specified and for the purpose stated. 20 25

Dated this 16th day of November, 1909.

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[This Drawing is a full-size reproduction of the Original.]



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