April 7, 1931. H. BLIDSOE 1,799,498

AEROPLANE ENGINE

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Fig. 1.

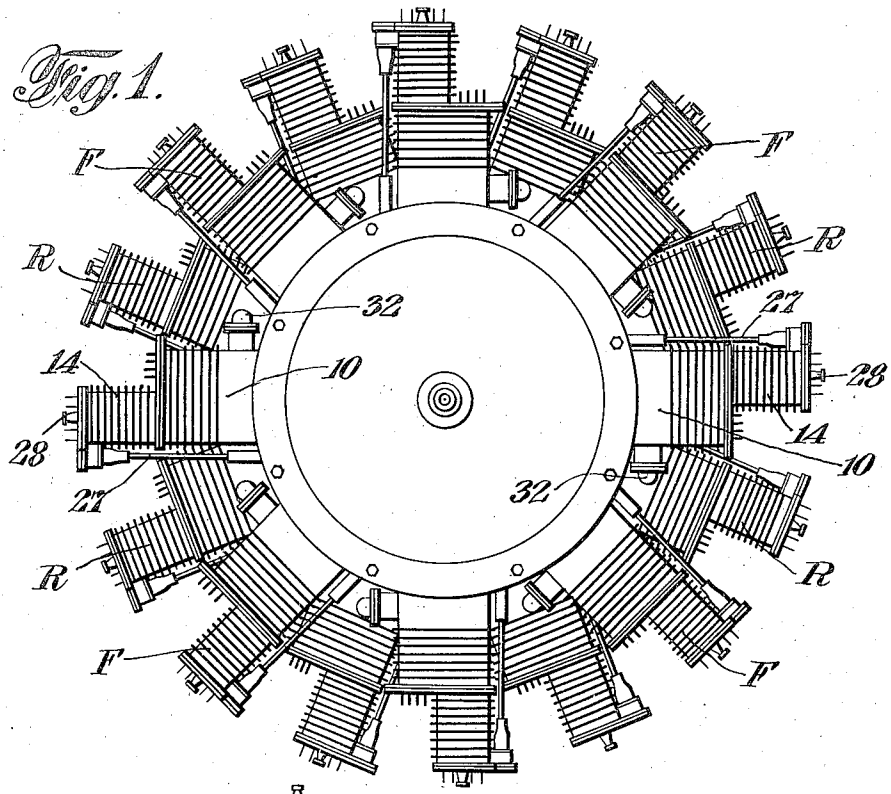
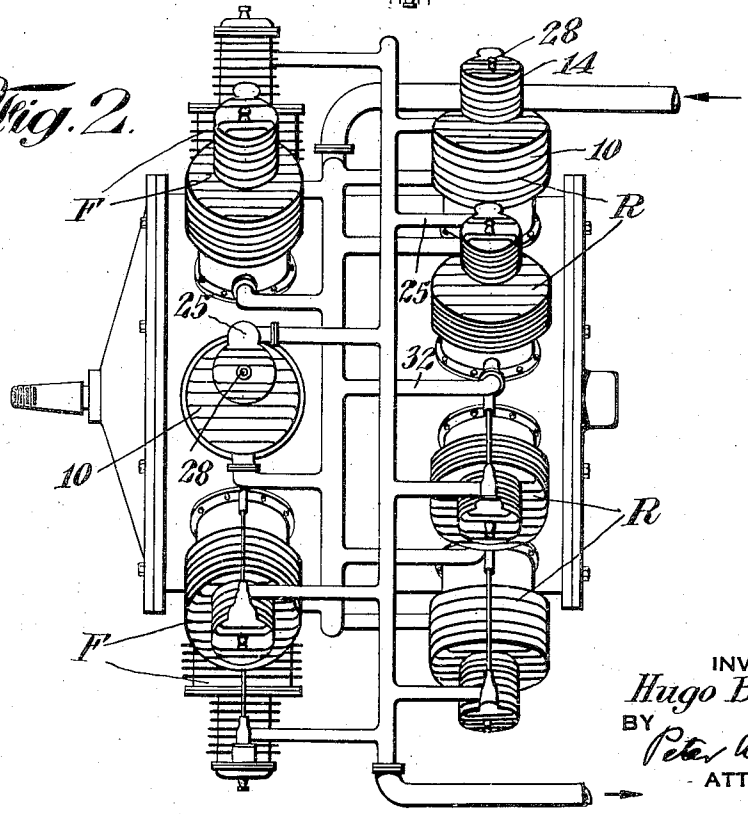


Fig. 2.



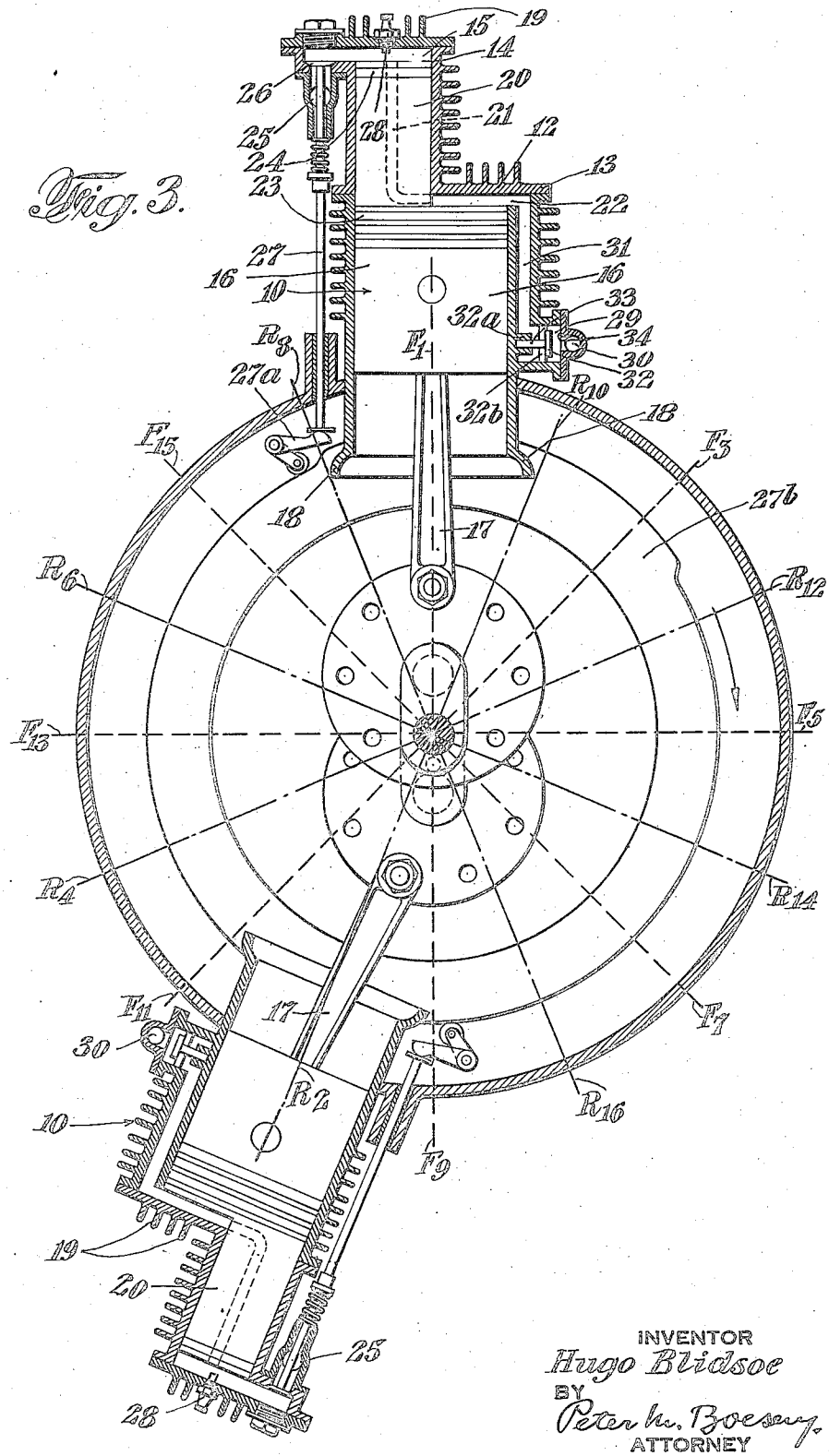
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Fig. 3.



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UNITED STATES PATENT OFFICE

HUGO BLIDSOE, OF NORTH PLAINFIELD, NEW JERSEY

AEROPLANE ENGINE

Application filed March 12, 1930. Serial No. 435,112.

This invention relates to new and useful improvements in aeroplane engines, and, while the detail arrangement incidentally comprises a double row of cylinders arranged for conveying power to the same propeller shaft, it has been a special object of this device to construct an engine, or motor, that would prove of superior durability and efficiency as to the power yielded.

The invention proposes an aeroplane engine with cylinders, each having a circular protruding portion, and a piston within each cylinder, said piston to have an outer end circular extension engageable in the said protruding portion; an opening for inlet and exhaust being formed in the said circular extension of the piston.

It will thus be evident, that there in this manner has been provided a double combustion chamber, although the firing practically will take place simultaneously.

An ante-chamber with what may appropriately be termed a floating valve is arranged upon the lower side of the cylinder, said ante-chamber connecting the gas inlet pipe with the lower combustion chamber.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:—

Figure 1 is a side elevational view showing the relative arrangement of the two rows of cylinders, one behind the other; Figure 2 is a top plane view of the said cylinders, while Figure 3 illustrates the detail construction of the cylinders proper.

In the embodiment of my invention shown in the drawings there are sixteen cylinders, eight in each row. Only one cylinder of each row, however, has been shown in detail; the front cylinders are designated by the character F and the rear ones by R. The firing order is indicated by the subnumerals F_1, R_2, F_3, R_4, F_5, R_6, etc.

Referring more particularly to the drawings, 10 indicates one of the cylinders. Each cylinder is provided with a cylinder head 12, comprising a flange 13 and a circular protruding portion 14 so as to form a hollow portion 15. A piston 16 is slidably mounted within each of the cylinders, and each connects by means of a rod 17 with a crank shaft.

The cylinders are arranged in a circle as shown in Figure 1, the usual oil tank and piping being provided for.

The inner ends of the cylinders should be of a cup form indicated by reference numeral 18, so that splashing oil within the casing may readily be directed within the interior of the cylinder.

The said cylinders are provided with means for cooling, indicated by fins 19.

The piston 16 is formed with a circular extension 20. An opening 21 connects the outer side of the said extension with the lower combustion chamber 22. Piston rings 23 are mounted upon the pistion 16, and piston rings 24 upon the circular extension 20.

Each of the cylinders is provided with an exhaust port 25 cooperating with an exhaust valve 26, the latter being operated by a valve rod 27 connected with a crank 27*a* and actuated by a cam disc 27*b* in the usual manner, as shown in Figure 3. A spark plug is indicated by 28.

Corresponding to the upper combustion chamber arranged in the circular protruding portion 14 of the cylinder, is a lower combustion chamber 22, extending vertically and horizontally with respect to the main portion of the piston 16, the said upper and lower combustion chamber registering by means of the opening 21 in the circular piston extension 20.

An ante-chamber 29, serving as an inlet port, is formed upon the lower side of the cylinder; the said chamber connects with an intake pipe 30.

In the said chamber is arranged a valve 32, the said valve being provided with a stem 33; this valve is slidably supported at its inner end and by a boss 32*a* and fins 32*b* acting as stops during the suction stroke which moves the valve to the central position in the

said ante-chamber, thereby admitting the inflow of gas during said stroke.

It will be evident that during the compression, the expansion and the exhaust strokes the said valve will on account of the higher pressure within the cylinder be pushed outward towards the front wall 34 of the antechamber with the result that the said valve in this position will close the inlet port 30. During the intake stroke, however, the condition is reversed, as the suction from within during this stroke produces a partial vacuum which draws the said valve away from the intake pipe 30 to an intermediate position in the said antechamber, as the said valve will be held midways in the latter by means of the fins 32*b*, thus permitting the inflow of gas to the combustion chambers.

It is evident, that otherwise the operation of this engine is substantially similar to that of an ordinary internal combustion engine.

While I have illustrated and described my invention with some degree of particularity I realize that in practice various alterations therein may be made. I therefore reserve the right and privilege of changing the form of the details of construction or otherwise altering the arrangement of the correlated parts without departing from the spirit or scope of the appended claims.

What I claim as new, and desire to secure by Letters Patent of the United States, is:—

Claims.

1. In an aeroplane engine, a plurality of cylinders projecting therefrom, each cylinder provided with a cylinder head formed with a circular protruding portion, and with a piston formed with an outer end circular extension engageable in the said protruding portion, inlet means comprising an antechamber having a floating valve arranged therein, and an exhaust port in the said circular extension.

2. An aeroplane engine having a plurality of cylinders, each cylinder comprising a lower broader and an upper more narrow portion, a piston shaped to fit said cylinder and being at its upper portion provided with means for conveying gas to the upper cylinder portion, and a floating valve controlling the inlet of gas, substantially as shown and described.

3. An aeroplane engine having a plurality of cylinders, each cylinder being formed with a wider bottom portion and a more narrow top portion, the said bottom portion terminating in a flange, a piston comprising a corresponding wider bottom portion and a more narrow top portion, means arranged in the top portion of the said piston for conveying gas to the upper portion of the cylinder, an ante-chamber arranged upon the side of the lower portion of the cylinder and means disposed in the said ante-chamber for the regulation of the inlet of gas.

4. In an aeroplane engine a plurality of cylinders arranged in two rows, each cylinder being provided with a double bore, one in elongation of the other, the lower one being of a substantially wider and the upper one of a more narrow dimension, a piston correspondingly shaped, a tubular opening arranged in the upper portion of the piston for conveying gas to the upper portion of the cylinder, a slidable exhaust valve and a floating intake valve, the latter being disposed in the ante-chamber arranged upon the side of the cylinder and adapted to convey gas from the inlet pipe to the said cylinder, means for actuating the piston, and cooling fins arranged upon the said cylinder.

5. An aeroplane engine having a plurality of cylinders, each cylinder comprising a lower broader and an upper more narrow portion, a piston shaped to fit said cylinder and being at its upper portion provided with means for conveying gas to the upper cylinder portion, and a floating valve controlling the inlet of gas, each cylinder comprising a double combustion chamber, a piston fitted to operate in connection with said double chamber, the upper portion of the piston being formed with a channel for connecting the two sectional combustion chambers, an ante-chamber arranged upon the lower side of the cylinder and adapted to cooperate with a floating valve controlling the inlet of gas, and means for regulating and guiding said floating valve.

Signed at New York city, in the county of New York and State of New York this 1st day of March, A. D. 1930.

HUGO BLIDSOE.