Oct. 18, 1932. F. GOSSLAU 1,883,781

MULTICYLINDER TWO-STROKE INTERNAL COMBUSTION ENGINE

Filed Aug. 23, 1930

Fig. 1.

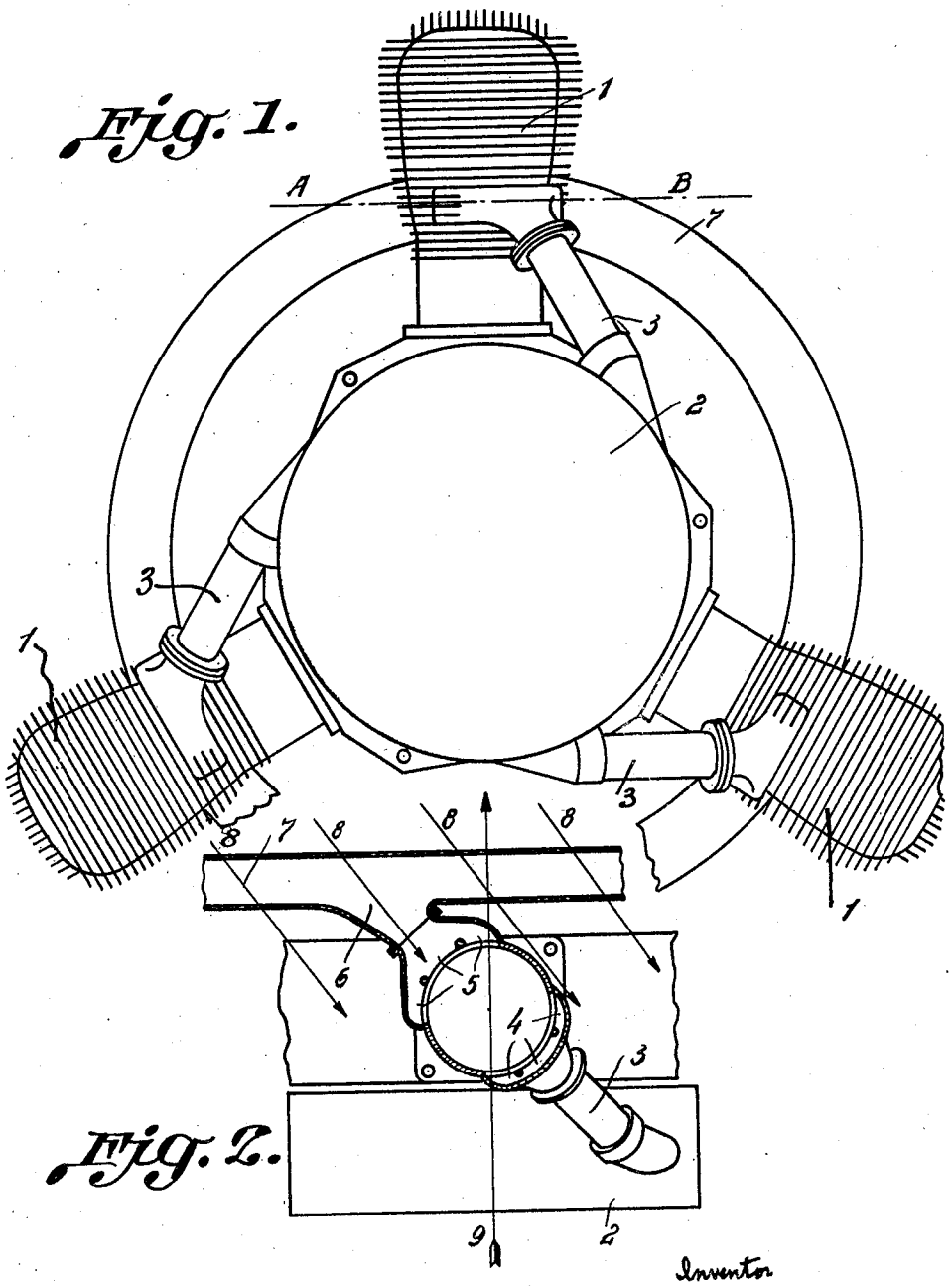


Fig. 2.

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MULTICYLINDER TWO-STROKE INTERNAL-COMBUSTION ENGINE

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In multi-cylinder internal combustion engines the fresh- and exhaust-gas ducts of the several cylinders are connected to one common manifold respectively, arranged on opposite sides of the cylinder middle plane. With two-stroke engines, for instance, the connecting pipes between the ports and their pertaining common air- and exhaust-pipes are generally arranged parallel or at right angles to the crank shaft axis. The drawback of this arrangement is that the gases are subject to great changes in direction of flow and, consequently, to speed losses.

The present invention is intended to overcome said drawback by the following arrangement: the connecting ducts between the scavenging and exhaust ports of each cylinder and the pertaining inlet- and exhaust-pipes lie in a plane which cuts the plane in which the cylinders are disposed at an acute angle is effected at acute angles to the motor shaft.

The accompanying drawing shows how my invention may be reduced to practice, by showing its application to an engine with radially arranged cylinders. In the drawing Figure 1 represents a side elevation of a three-cylinder engine, and Figure 2 a transverse section through the upper cylinder on the line A—B, Figure 1.

By means of pipe 3 the scavenging ports 4 of each cylinder are connected with the discharge chamber of blower 2. Through the medium of branch 6 the exhaust ports 5 are connected with annular main 7 which carries off the exhaust gases of all cylinders. The axes of branches 3 and 6 are in a plane which cuts the above mentioned cylinder plane at an acute angle.

This invention is of special importance for air-cooled radial cylinder engines for aircraft. Due to the unavoidable presence of the connecting pipes between the cylinder ports and the scavenging and exhaust pipes, it is impossible to provide cooling ribs at the portions of the cylinder surface where these pipes are joined. Thus, as much heat as possible must be carried off by the ribs on the remaining part of the cylinder surface. By the propeller arranged in front of the engine, the air is given a twist as shown by arrows 8, so that it does not strike the cylinders in the direction of the engine shaft and, consequently, neither in the direction of flight (9). If the connecting ducts in question are arranged in parallel or at right angles to the motor shaft as heretofore, part of the cylinder ribs would be shielded by these ducts, and the non-uniform cooling effect would result in a distortion of the cylinder. By choosing the proper angle at which the axis of the connecting ducts meet the motor shaft, the air, which is subjected to spiral movements by the propeller, can reach the cooling ribs uniformly by passing on either side of the pipes. This obviously results in a more effective and uniform cooling of the whole cylinder.

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. A multi-cylinder air cooled two stroke internal combustion engine for air craft having radiating ribs on its cylinders cooled by the air draft passing along the craft and having a common manifold respectively for the intake and exhaust ports of said cylinders and pipe connections between the two ports of each cylinder and their pertaining manifold, said manifolds being arranged on either side of the central plane through all cylinders, the two pipe connections of each cylinder being disposed in a common plane extending at an acute angle to said central plane, and following substantially the direction of the cooling air currents to which the cylinders are exposed.

2. A multi-cylinder air cooled two stroke internal combustion engine for air craft having radially arranged cylinders and radiating ribs on said cylinders cooled by the air draft passing along the craft and having a common annular manifold respectively for the intake and exhaust ports of said cylinders, one manifold arranged on each side of the plane in which the cylinders are arranged and pipe connections between the two ports of each cylinder and their pertaining manifold, the two pipe connections of each cylin-

der being disposed in a common plane extending at an acute angle to said cylinder plane, and following substantially the direction of the cooling air currents to which the cylinders are exposed.

3. A multi-cylinder air cooled two stroke internal combustion engine for air craft having radially arranged cylinders and radiating ribs on said cylinders cooled by the air current produced by the propeller of the craft, and having a common annular manifold respectively for the intake and exhaust ports of said cylinders, one manifold arranged on each side of the plane in which the cylinders are arranged and pipe connections between the two ports of each cylinder and their pertaining manifold, the two pipe connections of each cylinder being disposed in a common plane extending at an acute angle to said cylinder plane, and following substantially the direction imparted to the cooling air by the craft propeller.

In testimony whereof I affix my signature.

FRITZ GOSSLAU.